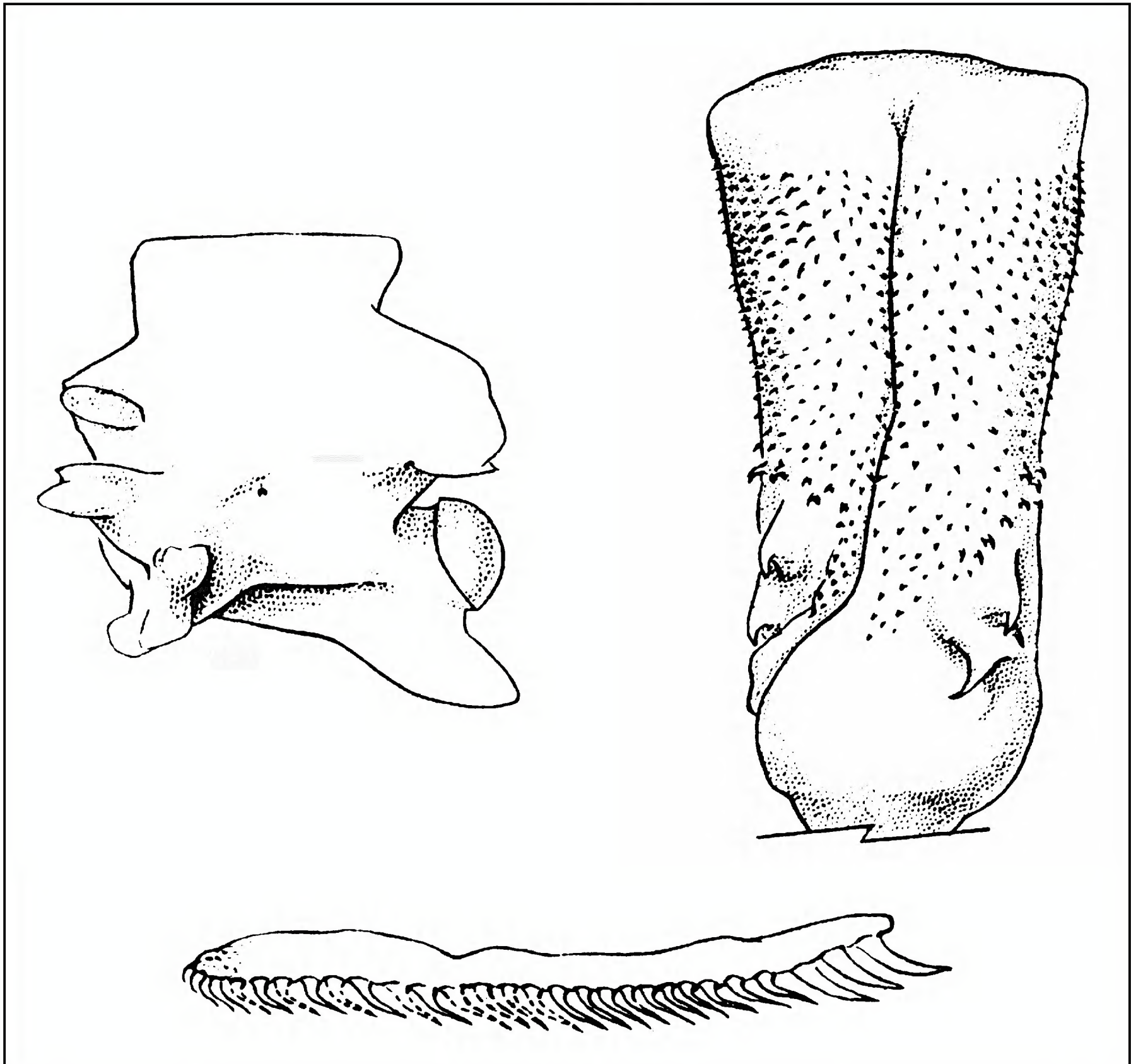

BULLETIN

of the

Chicago Herpetological Society



Volume 32, Number 4
April 1997



BULLETIN OF THE CHICAGO HERPETOLOGICAL SOCIETY

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On Viewing Cope's Illustration: An Exercise in Classification

Herndon G. Dowling
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Talladega, AL 35160

Upon receiving the December issue of the *Bulletin* [31(12)], I was impressed, again, by the cover drawing. As a kind of self-test, rather than turning the page to see what snake was depicted, I decided to see if I could identify the taxon from the drawing. I thought that perhaps other snake enthusiasts would like to see the process that I used to accomplish this.

At first glance, it was obvious that the drawing (reproduced here as Figure 1) was taken from Cope's monumental (and posthumous) 1900 volume on "The Crocodilians, Lizards and Snakes of North America." I know of no other herpetological work that uses this specific format of presentation.

► **Therefore, this is almost surely a North American snake.**

Let's see how far we can get by using Figure 1 alone. The drawing at the upper left shows nine crown scutes behind the rostral that covers the tip of the snout: paired internasals, prefrontals, supraoculars and parietals, with a single elongate frontal between the supraoculars. [See any fieldbook for descriptions of these scutes.]

► **This crown scute pattern is characteristic of advanced (caenophidian) snakes.**

This pattern is found in all caenophidians except those that are highly modified—which differ usually by fusion of adjacent scutes to aid in smoothing of the head surface and for greater rigidity in burrowing, or the breaking-up of large scutes for greater flexibility in the swallowing of large prey items. The best-known caenophidians that lack this pattern are the larger vipers and pitvipers, and the strange Wart Snakes (*Acrochordus*) of Southeast Asia.

None of the Blind Snakes (scolecophidians) or Primitive Snakes (henophidians) has this pattern, although it is approached by some of the Indian Roughtailed Snakes (Uropeltidae) and the Wood Snakes (Tropidophiidae) of the American tropics.

For some reason, this figure looked vaguely natricid (watersnake-like). I am not sure why. Was it the triangular internasals, with the nostrils placed somewhat dorsally? Was it the short prefrontals, providing a short-snouted look? I am not sure.

The drawing to the right, showing the ventral aspect of the head, does not give us much additional information. However, the paired anterior and posterior genials, the latter separated by small scales, are characteristic of and

► **reinforce the identification of this snake as a caenophidian.**

The drawing on the lower left, showing the lateral view of the head,

► **further corroborates the caenophidian identification**

and also indicates that this is a relatively generalized snake. The paired nasals, separated by the nostril, the small rectangular loreal (between the posterior nasal and the preocular), a single preocular and three postoculars, and the single anterior temporal followed by a pair of posterior temporals are all generally-found features of caenophidian snakes that are not highly modified for a specialized life. [The three postoculars are a little unusual, but characteristic of many natricids.] Also to be seen are eight supralabials, the fourth and fifth in contact with the eye, and (apparently) ten infralabials. Again, this is a generalized pattern of caenophidian snakes, found in many natricids.

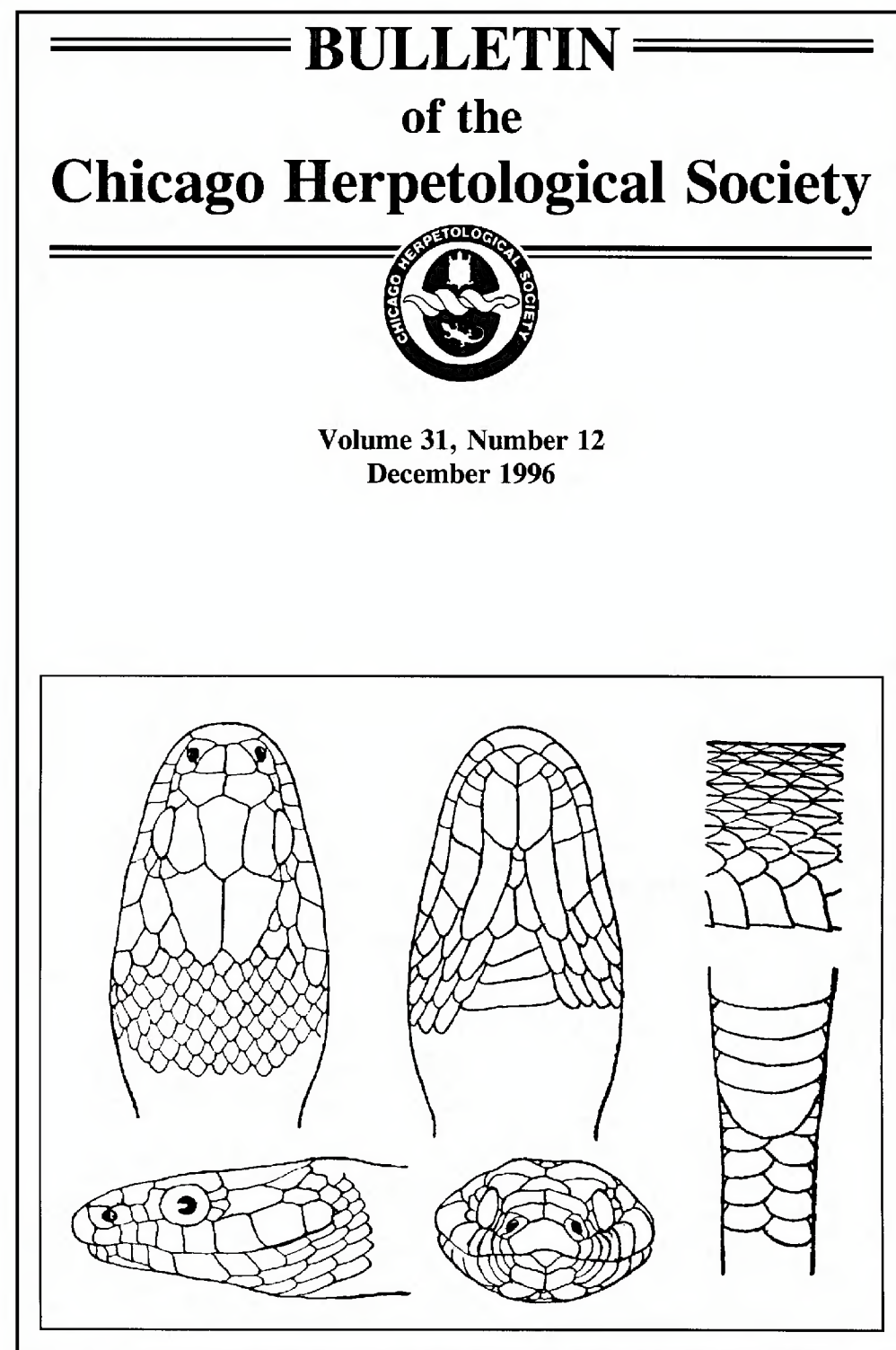


Figure 1. External morphology of *Thamnophis eques* (Cope, 1900).

The frontal view of the head (lower right) emphasizes the dorsolateral position of the nostrils; the broader-than-high rostral is a nonspecialized feature.

The lateral view of a midbody section on the far upper right shows that the snake had 19 dorsal scale rows, all of which are keeled except the first row (adjacent to the ventral scutes).

► **This pretty well confirms that this is a natricid snake.**

Although there are many North American snakes with keeled scales, relatively few have keels on all rows except the first. Nineteen scale rows are found in a number of North American natricids.

The lower drawing on the far right shows the broad ventral scutes that are characteristic of caenophidian snakes. It also shows an entire (undivided) anal scute.

► **Ha! *Thamnophis*! Among North American natricid snakes, other than the more specialized *Adelphis* and *Tropidoclonion*, which have fewer labial scutes, only the garter-snakes normally have an undivided anal.**

This is about all that I can learn from Cope's figure. Perhaps Doug Rossman or some other gartersnake specialist could identify the species from these drawings, but I can't. Nevertheless, they show the value of drawings for snake identification. [It may be noted that we have to go back to Cope in 1900 to find such drawings for most North American snakes.]

No good scientist, though, would be satisfied with an identification from a drawing (and to be a good herpetologist, you have to be a good scientist). You would want to have the actual specimen, or better still, a series of specimens, alive or dead, to make additional observations. How do you know that the drawings are correct? Most drawings are *not* correct! Some are wrong in minor ways, others in important ways.

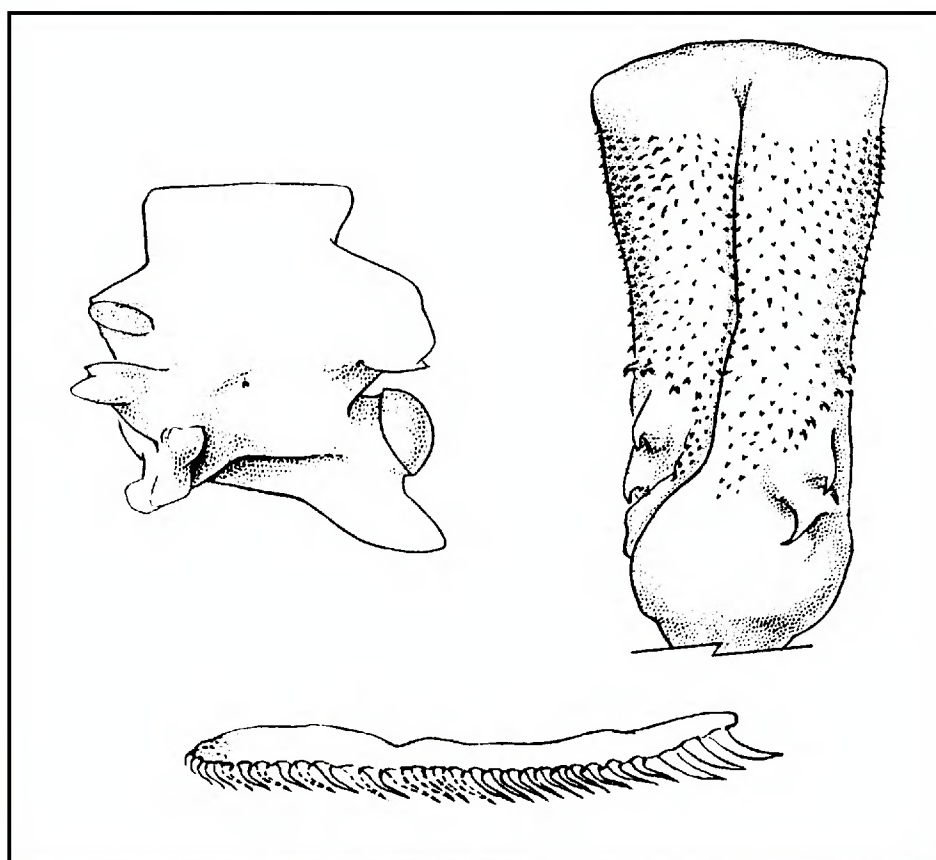


Figure 2. Internal morphology of *Thamnophis sauritus*: posterior body vertebra, hemipenis and maxilla.

How do you know that the snake is from North America? Just because I said so? That's not good science!

[Although it would be best to have an actual specimen, this is not possible here. Instead, we will utilize "prior knowledge," including Figure 2, which was drawn by Frances Waite under my supervision.]

First, let's confirm that it is a snake. The elongate body and tail, the absence of limbs, eyelids, and external ears all suggest that is a snake, but some lizards have these features as well. The **broad, overlapping ventral scutes** (shown in Figure 1) do confirm its snakesness, however; no other reptile has these. If (as good scientists) we want further evidence, we might look inside.

A look at the skull (not shown) is highly informative. The **braincase is solidly sutured**, protecting the brain from both above and below, but the **temporal arches are gone**, and the **jaws are very loosely articulated**, being attached to the braincase only by muscles and ligaments, and with the **two halves of the lower jaw joined by a ligament**. There are needle-like **teeth** on the maxillae of the upper jaws (Figure 2) and on the dentaries of the lower jaws, but also **on the paired palatines and pterygoids** in the palate. All of these toothed bones are **individually moveable**, although the palatines and pterygoids of each side usually work as a unit. No non-snake terrestrial vertebrate has such a complicated feeding system. Also the animal lacks any evidence of pectoral limbs or a pectoral girdle. So it is a snake (Suborder **Serpentes**). But what kind?

To check its infraordinal status, we examine the skull again. The lower jaw **lacks** a bone, **the coronoid**, that is present in primitive snakes, suggesting that it is a caenophidian (an advanced snake). The snake also **lacks** any trace of **pelvic elements** and the **left lung is reduced** to a vestige (or absent): two other characteristics of advanced snakes. Further, there is a small disk-like piece of cartilage on the lower end of each rib, where it is connected (by muscles and ligaments) to the ventral scute. This feature is found only in advanced snakes, so this snake is a member of the infraorder **Caenophidia**. But is it really a gartersnake?

To determine its familial status, we must go back inside. We note that the vertebrae that make up the spinal column (Figure 2) have downward-projecting elements (**hypapophyses**) **throughout the length of the body region**. Most snakes lack these elements in the rear part of the body; their presence is a natricid characteristic, but it is not definitive. Vipers and pitvipers (Viperidae and Crotalidae) also have these, as do cobras and their relatives (Elapidae, Hydrophiidae, Laticaudidae). But we have already examined the teeth in our snake (Figure 2) and found no fangs, so it does not belong to these venomous taxa.

There are some other nonvenomous snakes (mainly in Africa and Asia) that do have posterior hypapophyses, though, so we must look at additional features. The hemipenes (paired male sexual organs of snakes and lizards) tend to be definitive. Our snake has such an organ (Figure 2) that is covered with

spines except for a nude tip. It also has some **enlarged hooks** around the base, and a **single** groove (the sulcus spermaticus) extends from the base up the middle of the organ to **end between the apical lobes**. Such an organ is characteristic of the natricids, so together with the other features that we have examined, we can classify this snake as a natricid (family **Natricidae**). The natricids are essentially worldwide except for South America, however. How do we know that it is North American?

Well, the expanded **nude tip** of the hemipenis (lacking in Old World natricids) suggests that it is, but we have to go to its chromosomes (not shown) for confirmation. American natricids have a relatively rare chromosome morphology. They have the 18 pairs of chromosomes that most snakes do, but there is **no distinct division** in size that is characteristic of most others. Most snakes have a group of six or eight pairs of large chromosomes (macrochromosomes) that are distinct from the remaining much smaller ones (microchromosomes). North American natricids differ in that there is a gradual reduction in size from the largest chromosomes to the smallest, without this definite point of division. This is the case in “our” snake, which (with the other features) confirms it as a North American natricid, and thus a member of the subfamily **Thamnophiinae**.

We have already noted that the entire anal scute (Figure 1) tends to identify this snake as a *Thamnophis*, and this and its specific status might be further confirmed by the combination of scale and scute numbers, dorsal and ventral coloration, striped pattern, and distinctive head pattern that is given in Cope's text.

You may note that we have dealt strictly with morphological characteristics in this analysis, but it is possible to utilize molecular and genomic information as well. It has been shown that North American natricids differ from other snakes by both immunological and electrophoretic methods (see references below). That these entirely different sets of data confirm the identification obtained by morphological observations gives us greater confidence that our identifications to the various levels of classification are correct. We need these several sources of confirmation because of our human fallacies. As said by someone (?? I forget who), “what we see is not what **it is**, but [at least in part] what **we are**.” As good scientists, we try to reduce the effect of the latter.

The results of our investigation, then, can be summarized in the following classification (from a recent publication of mine):

Suborder Serpentes — Snakes

Infraorder Caenophidia — Advanced Snakes

Family Natricidae — Water Snakes and Allies

Subfamily **Thamnophiinae** — American Watersnakes
and Gartersnakes

Genus *Thamnophis* — American Gartersnakes

[and, from the information given on the inside cover page of the *Bulletin*,]

Species *T. eques*

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Rossman, D. A., N. B. Ford and R. A. Seigel. 1996. The garter snakes: evolution and ecology. Norman, OK: Univ. Oklahoma Press. [All you want to know about *Thamnophis* species. Many color photos.]

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Bull. Chicago Herp. Soc. 32(4):80-83

A Double-Bodied Midland Water Snake and Additions to the Literature on Ophidian Axial Bifurcation

Stephan Swanson¹, Frank van Breukelen², Brian Kreiser², David Chiszar³ and Hobart M. Smith³

Abstract

An opisthodichotomous *Nerodia sipedon pleuralis* is described, and recent literature on ophidian somatodichotomy is reviewed.

In most vertebrates identical twins occur only rarely, and snakes are no exception. Most such twins that have been recorded in snakes are incompletely separated, and about them a considerable literature has accumulated, as summarized by Cunningham (1937), Pérez-Higareda and Smith (1987), Payen (1991) and Wallach (1995). Those accounts make plain that that opisthodichotomy (only part of body and tail duplicated, head single) is one of the rarer forms (fewer than half a dozen recorded) of an already rare twinning; much more common is duplication of the head only (craniodichotomy) or of the head and forepart of body (prodichotomy), the rest of body and tail remaining entire (both conditions are referred to collectively as dicephaly). Perhaps equally rare are amphidichotomy (anterior and posterior parts of body duplicated, the middle undivided) and urodichotomy (only the tail duplicated).

Thus the occurrence of an opisthodichotomous *Nerodia sipedon pleuralis* Cope, discovered by one of us (SS), is of special interest, and is previously unreported in the genus. It was born to a specimen from Gorham, Jackson County, Illinois, preserved within 24 hours of birth, and is now in the GNHL museum (no. GR 1995-1). All parts posterior to the

head are duplicated, but the two individuals are fused to each other, venter to venter, as far posteriorly as the paired umbilicus, and in addition the venter of each individual (both males) is fused at two tight loops of the body (Figures 1, 2). The free part, posterior to the umbilicus, is 53 mm (tail 35 mm) in one, 63 mm (tail 38 mm) in the other. Clearly the twins could not have lived long, unable to move. A normal neonate male of *N. sipedon* examined for comparative purposes has a tail length of 55 mm and a total length of 218 mm, presumably approximating the total lengths of the twins.

Although the head and a short length of the neck (10 dorsals, 5 mm posterior to parietals) are single externally, and the ventral surface of the head appears normal, the dorsal surface of the head is deformed in such a way as to suggest a partial internal division. The posterior part is broader than usual (7.5 mm, head length to angle of jaws 9.5 mm), there is a large interparietal scale extending from occiput to frontal and as broad as or broader than either parietal (no interparietal normally occurs in any colubroid snake), and the frontal is



Figure 1. The partially paired *Nerodia sipedon pleuralis*, with dorsal view of the head. Head length to angle of jaws, 9.5 mm, estimated total length approximately 218 mm. The insect pin, which served to spread the specimen somewhat, is 37 mm in length.



Figure 2. An X-ray of the specimen depicted in Figure 1, using two pins to spread it.

-
1. The Grove National Historic Landmark, Glenview Park District, 1421 Milwaukee Avenue, Glenview, IL 60025.
 2. Department of Environmental, Population and Organismic Biology, University of Colorado, Boulder, CO 80309-0334.
 3. University of Colorado Museum, Boulder, CO 80309-0218.

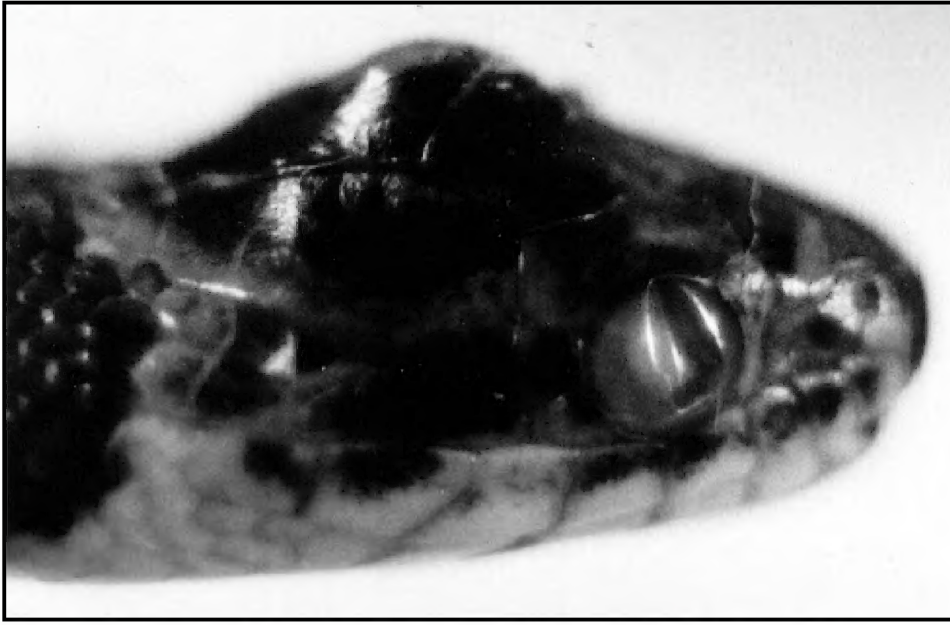


Figure 3. Lateral view of the head of the partially paired snake, showing the conical dorsal protrusion.

wider (3.8 mm) than long (3.0 mm in median line, 3.5 mm at sides), much wider than either supraocular (max. 1 mm) (the frontal is normally at least twice as long as wide, and not twice as wide as either supraocular). The snout, anterior to the eyes, is more or less normal, perhaps only slightly foreshortened, although the nasal and loreal are fused on each side. The two prefrontals and internasals are essentially normal, as is the rostral and on each side the single preocular, two postoculars (normally three, however), 1–2 temporals, eight supralabials (the 4th and 5th contacting the brille), and 8–9 infralabials (normally 10 or 11, however). A conspicuous conical hump arises at the anterior end of the interparietal, involving the posterior part of the frontal (Figure 3).

The pairing starts abruptly 11 middorsal scales posterior to the interparietal, where the two dorsal surfaces are rotated, one to the left, the other to the right, and the apposed ventral surfaces fused. Only the anterior two and the 4th ventrals are unmodified; the 5th, 6th, 7th and 8th ventrals are split transversely on one side (left), and the remainder, as far posterior as slightly past the umbilicus, are split longitudinally down the middle (retention of an embryonic condition). The ventrals number 135 (left) and 140 (right), and the caudals 69 and 71 respectively; all are within normal expectation (Smith, 1961). The scale rows are much fewer than normal, however, both anteriorly (19 rather than 23) and posteriorly (14 rather than 17 or 19) in both individuals. The pattern conforms with expectation for the subspecies, there being 17 dark caudal rings in each, lateral dark bars much shorter than interspaces, 13–15 alternating dark dorsal spots and lateral bars, and semilunar dark ventral marks in two longitudinal rows.

Supplementary Records

The unpublished (under criteria of the International Code of Zoological Nomenclature) dissertation by Payen (1991) is a uniquely thorough survey of axial bifurcation (= somatodichotomy) in reptiles (including crocodilians, turtles, lizards as well as snakes) as determined by a world-wide survey of examples in museums and comparable institutions, and a review of the literature. Numerous records were unearthed that had escaped notice by or followed Cunningham (1937) and Pérez-Higareda and Smith (1987). Wallach (1995) also added new records of

axial bifurcation in snakes.

Inasmuch as Payen's (1991) work is not readily available, we here list the snake taxa newly recorded therein, directly or indirectly, with axial bifurcation, and we add those given in Frye (1991) and Wallach (1995). Also, inasmuch as Payen did not distinguish between craniodichotomy and prodichotomy, referring to both as bicephalic, we here record examples she so designated as "dicephalic," altering her terminology for etymological purity (all parts from Greek, whereas "bi-" is from Latin).

BOOIDEA

Epicrates cenchris maurus: Payen (1991: 94), "dicephalic."

Epicrates striatus: Payen (1991: 54), "dicephalic."

Python sp.: Payen (1991: 115), "dicephalic."

Tropidophis melanurus: Matz (1989) fide Payen (1991: 54–55), "dicephalic."

COLUBROIDEA

Unidentified: Payen (1991: 92–93), 2 "dicephalic;" St. Hilaire (1837) fide Payen (1991: 109), "dicephalic."

Carphophis amoenus amoenus: Payen (1991: 55), listed as *C. amoenus*, but here allocated to subspecies on the basis of locality, Durham, Durham County, North Carolina. "dicephalic."

Coluber jugularis: Payen (1991: 56), "dicephalic."



Figure 4. Dorsal view of the head of the partially paired snake, showing the large interparietal between the two parietals.

Coluber ravergeri: Payen (1991: 56). “dicephalic.”
Diadophis punctatus punctatus: Payen (1991: 57), “dicephalic.” Listed as *D. punctatus*, but here allocated to subspecies on the basis of locality, Moore County, North Carolina.
Elaphe dione: Payen (1991: 97), “dicephalic.”
Elaphe obsoleta lindheimeri: Calmonte (1983) fide Payen (1991: 115-116), “dicephalic.”
Elaphe quadrivirgata: Payen (1991: 58), “dicephalic.”
Erythrolamprus aesculapii: Matz (1989) fide Payen (1991: 97-98), “dicephalic.”
Lycophidion capense capense: Payen (1991: 118), “dicephalic.”
Masticophis flagellum subsp.: Matz (1989) fide Payen (1991: 89-90, pl. 3, fig. 1), amphidichotomous. Listed as *Herpetodryas flagelliforme* from “North America.”
Philothamnus semivariegatus: Payen (1991: 65-66), “dicephalic.”
Pituophis catenifer deserticola: Frye (1991: 404, 410 fig. 11-18a), prodichotomous.
Sibon sp.: Payen (1991:69), “dicephalic.” Listed as *Tropidodipsas fischeri* from Nicaragua, in the Vienna Museum. The species does not occur there, but three other species of the genus do (Villa et al., 1988). Furthermore, Payen questioned the identification, noting the resemblance of the snake to *Nerodia fasciata* or *N. sipedon*.
Sinonatrix annularis: Payen (1991: addenda, p. 1), “dicephalic.” Listed as *Natrix annularis*.
Thamnophis atratus atratus: Wallach (1995: 127), craniodichotomous.
Thamnophis couchii: Payen (1991: 67), “dicephalic.”
Thamnophis cyrtopsis collaris (?): Payen (1991: 68), “dicephalic.” Listed as *T. sirtalis* from Lake Chalco, Mexico. That species does not occur there. We regard the specimen, in the Vienna Museum, as likely representative of the subspecies here tentatively indicated.
Thamnophis elegans terrestris: Payen (1991: 67), “dicephalic.” Listed as *T. elegans*, but here allocated to subspecies on the basis of locality, Alameda County, California).
Thamnophis eques eques: Payen (1991: 59-60), “dicephalic.” Listed as *Eutaenia macrostemma*, but here allocated to the indicated subspecies on the basis of known synonymy and probable locality, Guanajuato.
Thamnophis gigas (?): Wallach (1995: 127), prodichotomous.
Xenodon severus: Payen (1991: 70), urodichotomous.

ELAPOIDEA

Austrelaps superbus: Payen(1991: 70-71), “dicephalic.”
Aipysurus laevis: Payen (1991: 71-72), “dicephalic.”

VIPEROIDEA

Vipera ammodytes: Matz (1989) fide Payen (1991: 108), “dicephalic.”

In addition, numerous reports appear in Payen’s work (1991) of ophidian axial bifurcation that are supplementary to those in Cunningham (1937) and Pérez-Higareda and Smith (1987), and still others appear in Frye’s massive work (1991), in Swanson (1997), Wallach (1995) and Watkins-Colwell (1995). These are summarized below.

We take special note here, however, that Swanson (1997) illustrated an extremely rare case of opisthodichotomy in an agamid lizard, *Pogona vitticeps*. Payen (1991) does not record opisthodichotomy in any lizard.

Likewise of general interest is the brief review (in Russian) by Khosatsky (1991) of somatodichotomy in reptiles, with illustrations of three examples, including two snakes. Three Russian references are cited, but no ophidian taxa are listed that have not been dealt with elsewhere.

BOOIDEA

Boa constrictor: Payen (1991: 122-123), “dicephalic.”
Boa constrictor constrictor: Cunha (1968) fide Payen (1991: 96), “dicephalic.”
Python molurus bivittatus: Payen, (1991: 54), “dicephalic.” Frye (1991: 405), “dicephalic.”

COLUBROIDEA

Coluber constrictor constrictor: Frye (1981: 322, figs. 13-18), fide Payen (1991: 56), “dicephalic.” Frye (1991: 404, figs. 11-18b, d), amphidichotomous and prodichotomous. Wallach (1995: 128), craniodichotomous and holo-dichotomous.
Elaphe guttata guttata: Payen (1991: 115, addenda p. 1), two specimens, “dicephalic.”
Elaphe longissima longissima: Payen (1991: 58), “dicephalic.”
Elaphe obsoleta confinis: Wallach (1995: 128), craniodichotomous.
Elaphe obsoleta obsoleta: Frye (1991: 404), “dicephalic;” Watkins-Colwell (1995), prodichotomous.
Elaphe quatuorlineata: Payen (1991: 58-59), “dicephalic.”
Elaphe rufodorsata: Payen (1991: 59). “dicephalic.”
Elaphe vulpina: Frye (1991: 404, 410 fig. 11-18c), prodichotomous.
Homalopsis buccata: Payen (1991: 98), “dicephalic.”
Lampropeltis alterna: Swanson (1997), opisthodichotomy (identification by pers. com.).
Lampropeltis getulus californiae: Frye (1991: 404, 406 fig. 11-16a-b), prodichotomous. Matz (1989) fide Payen (1991: 88-89), “dicephalic.” Payen (1991: 112), “dicephalic.”
Natrix natrix: Strohl (1925) fide Payen (1991: 100-101), eight “dicephalic” specimens. Ladeiro (1935) fide Payen (1991: 118), “dicephalic.” Naulleau (1983) fide Payen (1991: 62-63), “dicephalic.”
Pituophis catenifer annectens: Frye (1981) fide Payen (1991: 113-114), “dicephalic.”
Pituophis catenifer catenifer: Frye (1981) fide Payen (1991: 114-115), “dicephalic.” Frye (1991: 404, 406 figs. 11-16c-f), prodichotomous. Payen (1991: 115), four “dicephalic.” Wallach (1995: 127), craniodichotomous.
Regina septemvittata: Frye (1991: 405), craniodichotomous.
Storeria occipitomaculata occipitomaculata: Frye (1991: 404), prodichotomous.
Thamnophis elegans vagrans: Payen (1991: 67-68). Wallach (1995: 128), prodichotomous (same snake as Payen’s).
Thamnophis sirtalis sirtalis: Payen (1991: 68-69), three examples, all “dicephalic.” Wallach (1995: 128), amphidichotomous.

VIPEROIDEA

Agkistrodon blomhoffii: Payen (1991: 72), “dicephalic.”

Agkistrodon contortrix contortrix: Payen (1991: 72-73),
“dicephalic.”

Bothrops sp.: St. Hilaire (1837) fide Payen (1991: 105-106),
“dicephalic.”

Bothrops atrox: Wallach (1995: 128), prodichotomous.

Crotalus sp.: Payen (1991: 107).

Crotalus atrox: Engelmann and Obst (1981: 50, fig.),
craniodichotomous.

Crotalus viridis viridis: Payen (1991: 76), “dicephalic.”

Vipera sp.: St. Hilaire (1837) fide Payen (1991: 109),
“dicephalic.”

Vipera aspis: Naulleau (1983) fide Payen (1991: 76-77),
“dicephalic.” Matz (1989) fide Payen (1991: 108),
“dicephalic.” Payen (1991: 93), craniodichotomous.
Vipera berus: Payen (1991: 108), “dicephalic.”

Acknowledgments

We are much indebted to Van Wallach for help with the literature, to Prof. H. William Peterson for initiation of this study, and to Drs. Carl Bock, Mike Grant and Shi Kuei Wu for provision of space and facilities.

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Sperm Storage in an Eastern Blue-tongued Skink, *Tiliqua scincoides* (Hunter, 1790)

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Reproduction in Australian snakes and lizards has been relatively little studied. Sperm storage is known and has been previously documented in some Australian species. Examples of incidents possibly indicative of sperm storage in snakes are documented by Magnusson (1979) for an Arafura file snake, *Achrochordus arafurae*, and Hoser (1995) for death adders, *Acanthophis antarcticus*.

For the *A. arafurae* the sperm storage or fertilized egg retention was for 7 years. Furthermore a case at Brookfield Zoo, Chicago, in the United States indicated a possibility of parthenogenesis in specimens of this species (Anonymous, 1989). (Shine et al. 1995 suggest the above results may be from long term "mummification" of embryos rather than sperm storage or parthenogenesis).

For the *A. antarcticus* the sperm storage indicated appeared to be over-winter only. Withers and O'Shea (1993) are of the view that sperm storage of two to three months is common in snakes. This view has been corroborated by Shine's studies on many species, which are largely summarized in his book (Shine, 1991).

Ehmann (1992) indicates over-winter sperm storage for a number of smaller skinks, including *Leiolopisma rawlinsoni*, in which he specifically states that over-winter sperm storage occurs. Over-winter sperm storage in a population of *Hemiergis peronii* was documented by Smyth and Smith (1968), although Hutchinson (1993) notes a degree of variability between different species within this genus, indicating that not all females routinely store sperm over winter. Most Australian lizards (or snakes) have not been properly studied as to their ability to maintain viable sperm over long periods of time.

Around Christmastime 1985, Neil Simpson caught a gravid female *T. scincoides* at Milperra, NSW (33°57'S, 150°58'E). He housed the lizard in the nearby suburb of Bankstown, where 23 live young were produced. The adult was retained in a cage by itself and produced a second litter (12 young) the following summer. At no stage did the adult lizard have contact with others of its own species except for the young produced in 1986. This latter contact took place immediately after birth only. Thus, there was no possibility of the female mating with young as in the case documented by Riches (1988). Simpson was unable to recall if the female had passed unfertilized ova or similar material, although he noted that there were no stillborn young (or none observed) on either occasion.

To the best of our knowledge no other evidence for sperm storage has been documented in *T. scincoides*. The case documented above may not represent typical behavior for this species. However, assuming this phenomenon has gone unreported in this relatively large and common species over the last 200-odd years, then it may be a similar story for other common Australian reptiles. It is critically important for those who maintain reptiles in captivity to keep accurate contact and reproduction records so that cases of possible sperm storage are more readily diagnosed and hopefully reported. This note has been published in the U.S. first as there appears to be more breeding of bluetongues (*Tiliqua*) in that country than in Australia, so further observations involving potential sperm storage are more likely to be observed in the U.S.

Acknowledgement

Glen Shea offered advice for improving a draft manuscript.

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**Book Review: *A Guide to the Snakes of Papua New Guinea* by Mark O'Shea
1996. Softcover. 238 pp., illustrated throughout with line drawings, and over 100 color plates.
Independent Publishing Group Pty Ltd., P.O. Box 168, Port Moresby, Papua New Guinea.**

**David Blatchford
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This book, the first comprehensive guide to the snakes of Papua New Guinea (PNG), is a tour-de-force. The 238 pages are literally packed with information, for the most part gathered first-hand by the author. The format makes such use of all available space that margins etc. are reduced to a mere border on each page, a worthy effort of which certain American publishers might take note. The English author has a passion for snakes that has taken him throughout the tropics; he is a former chairman of the International Herpetological Society and council member of the British Herpetological Society and when not traveling the world is the Curator of Reptiles at the West Midlands Safari Park in central England. Mark is also a Fellow of the Royal Geographical Society, an affiliate of the National Museum of PNG and owner of an oft-times ferocious beard.

Without a doubt New Guinea is best known as home to the fantastic birds of paradise, but it has some magnificent reptiles too in its catalogue of almost 300 species! And of this immense list there are 93 species of snake.

Five of the 80 land species are potentially capable of killing a human and some of these animals, the taipan in particular, are very dangerous indeed. So there is timely advice on first aid for snakebite in the most sensible place, right at the very beginning of the book. The information is given both in English and in pidgin English, the latter the lingua franca of a country with a population of about 4.7 million and, depending on definition, 80–800 different languages!

New Guinea is huge; it is the second largest island in the world and Papua New Guinea forms its eastern half. PNG is independent of Indonesia, which controls the western half of the island, known as Irian Jaya. The island contains a belt of limestone country that has weathered under tropical storms to form an extraordinarily harsh terrain. An east-west-trending zone of mountains includes elevations in excess of 13000 ft (4000 m). Overland travel is so difficult that communities have remained isolated; thus language has diversified to an astonishing degree.

The aim of the book is to act as a field guide—a guide to museum workers and reptile enthusiasts. But above all it is intended as a practical tool of conservation for the people who live in PNG, a message that is reinforced throughout.

A list of contents is prefaced by two beautiful plates of the exquisite green tree python, both as a juvenile in flamboyant yellow and in its adult livery of green with blue vertebral stripe. The next section discusses the snake diversity of PNG and includes a table listing the differences between snakes and lizards. This is relevant in a country with two of the 34 spe-

cies of the legless Australian pygopodid lizards. Each family of snakes represented in PNG is then described. These include Typhlopidae, Boidae (both boas and pythons), Acrochordidae, Colubridae, Hydrophidae and, most significantly in the Australasian region, the Elapidae, which have diversified to fulfil many of the roles occupied by colubrids in other parts of the world. The Elapidae include the most dangerous of the snakes of PNG, the taipan, the death adder, the small-eyed snake and finally an animal with near-mythical status, the Papuan black-snake.

There follows a description of snake skulls and snakebite including a dissection of the skull of a taipan illustrating only too clearly the prodigious size of the venom gland. Incidentally the lethal dose of venom from this species is estimated at 7 mg, while the animal is capable of injecting 100–200 mg per bite and has the reputation of biting repeatedly.

Uneasily interspersed with these chunks of technical information is a conventional “fact and fiction” section with the usual myths presented and dismissed plus an intriguing account of sorcery, snakes and snakebite. In a land where much of the population lives very close to the soil it is not surprising that snakes figure strongly in their beliefs.

The need for conservation is discussed next with the eloquent translation into pidgin — “Sapos yu painim sinek, yu no ken kilim!” An eight-page article on snakebite and its treatment by David Warrell (Centre for Tropical Medicine, Oxford, UK) and David Laloo (Faculty of Medicine, University of PNG) is included here for the use of physicians.

An identification key to the snake and legless lizard families of PNG is presented, accompanied by elegant annotated line drawings. The bulk of the text is given over to the species accounts. The most significant or distinctive species, such as the pythons or venomous snakes are allotted individual accounts while groups of similar forms—e.g., the burrowing snakes—are described en masse. The accounts follow the convention for field guides but the information also includes venom composition and effects, and the relevant antiserum and its dosage.

Where the possibility exists of confusing dangerous elapid species with other snakes they are listed in the account. For the three most significant species—the death adder, the taipan and the Papuan black snake—the author provides additional detailed lists of distinguishing features. Taxonomic notes are provided for each species and as the classification of some forms, for example pythons, seems to be an evolving art form this inclusion is particularly useful.

There is a complete checklist to the species in PNG and

then about 150 pages where each form is shown in color. Within each family, prior to the species accounts, there is a series of line drawings illustrating salient points that will aid in identification. Each page is color coded: green for non-venomous, red for mildly venomous, or red with skull and crossbones! There then follow about 30 superbly done range maps, yet another checklist, this one listing the dangerous species found in PNG by province, a gazetteer tabulating the exact locations mentioned within the range descriptions, a

glossary of scientific terms, and finally an annotated list of references and further reading.

There is no index; this is a guide oriented towards field use so practical identification of the species comes first.

This book has been a long time in the gestation but the wait was worthwhile; rarely can so much scholarly effort, and practical field experience have been sculpted between the covers of a single volume. Buy it tomorrow.

Bull. Chicago Herp. Soc. 32(4):86-88, 1997

HerPET-POURRI

by Ellin Beltz

CHS member pleads guilty

To prevent misunderstanding, the following press release from the U.S. Fish and Wildlife Service has been quoted verbatim: "A southern Illinois man today in court admitted his role in an international wildlife trafficking scheme that included smuggling of rare and protected reptiles from Spain, as well as shipping nearly 70 poisonous snakes through the U.S. mail in unmarked packages to avoid detection by authorities. James P. Zaworski, 31, of Marion, Illinois, pleaded guilty to one felony count of conspiracy to smuggle wildlife into the United States and to trade in protected species in interstate commerce. Zaworski, a reptile dealer known for his captive breeding success with small lizards called geckos, entered his guilty plea before Judge J. Phil Gilbert in U.S. District Court in Benton, Illinois, and now faces 5 years incarceration and/or a \$250,000 fine. The investigation into Zaworski's activities began in 1994 at Kennedy Airport in New York City, where U.S. Fish and Wildlife Service wildlife inspectors discovered a mail parcel from Spain addressed to Zaworski. Hidden within the parcel, were 13 Lilford's wall lizards, a small blue lizard that inhabits the Balearic Islands off the coast of Spain. These lizards are protected by an international treaty, the Convention on International Trade in Endangered Species (CITES), of which both the United States and Spain are signatory countries. Following the package to its destination in southern Illinois, U.S. Fish and Wildlife Service Special Agent Timothy Santel worked with U.S. Postal Inspectors, Illinois Conservation Police officers and other Service law enforcement officers to carry out a Federal search warrant at Zaworski's residence. They found records and documents chronicling 10 years of smuggling reptiles to and from Spain, France and South Africa. Among the reptiles seized at Zaworski's home were the 13 Lilford's wall lizards, European ladder ratsnakes also smuggled from Spain, box turtles illegally collected from a National Wildlife Refuge, venomous massasauga rattlesnakes mailed illegally from Florida, a timber rattlesnake and Great Plains ratsnakes listed as threatened species in Illinois, and two desert tortoises, a species considered threatened under the U.S. Endangered Species Act. Zaworski actively solicited and traded reptiles through the mail with Juan Gonzalez, a reptile supplier in Barcelona, Spain. Each would ship parcels containing live reptiles in plastic containers, using fictitious names and addresses. Packages were unmarked and declared as

'books' to avoid detection. Search warrants were also served on Gonzalez by authorities in Barcelona, and portions of the investigation are ongoing in Spain and several U.S. states. Additional people may be charged. Investigators found Zaworski frequently traded venomous snakes, collecting from the wild and subsequently mailing copperheads, timber rattlers, massasaugas, and speckled and diamondback rattlesnakes in violation of U.S. Postal laws. Zaworski was also found to have collected turtles and snakes from national wildlife refuges and national forests. These reptiles were then traded or sold to reptile collectors around the country. Among the wildlife laws Zaworski violated are the U.S. Endangered Species Act, which prohibits trade in endangered and threatened species; and the Convention on International Trade in Endangered Species (CITES) which prohibits or restricts trade in listed species among the 134 signatory countries. In addition, Zaworski's trading activities violated the Lacey Act, a Federal statute which prohibits interstate commercialization of wildlife in violation of State laws. Some of the species traded were protected by Illinois state law, including the Dangerous Animals Act which prohibits the possession of dangerous wildlife, including venomous snakes. This investigation was prosecuted by Assistant United States Attorney William E. Coonan, Southern District of Illinois and Jonathon Blackmer, U.S. Department of Justice, Wildlife and Marine Resources Section, Washington, D.C. In a related smuggling investigation, Robert L. Mitchell, St. Charles, Missouri, pleaded guilty in April 1996 for violations of the Lacey Act. Mitchell was fined \$10,000 for unlawfully importing 18 live Hermann's tortoises through the mail. These protected tortoises were sent by Gonzalez of Barcelona, Spain, in the same manner that Zaworski smuggled reptiles." [March 26, 1997, from Steve Grenard and Ron Brandon]

Another smuggling case prosecuted

The president and an employee of one of the largest U.S. wholesalers of reptiles and amphibians have been indicted by the Federal government for illegally importing 1,100 herps listed under the CITES treaty. The indictments were handed down on January 1, 1997, and charges include fraud, conspiracy and illegal international trade in wildlife. If convicted, penalties may include up to 49 years in prison and \$2.5 million in personal fines in addition to fines of up to \$5.3 million for

the Florida-based company. Most of the animals were from Argentina. [U.S. Department of Justice press release, March 1, 1997, summarized by Allen Salzberg]

Museum collection searched for illegal specimens

The Topeka, KS *Capital-Journal* reports that Federal agents of the U.S. Fish and Wildlife Service are “examining collections at the university of Kansas natural history museum to determine if specimens were imported illegally.” A special agent in Lenexa said that they are examining every specimen collected in the last few years and that an audit of the collections indicated that “450 specimens added to collections from 1991 to 1994 weren’t acquired in compliance with federal regulations regarding permits and documentation.” The museum’s director said that the irregular specimens were discovered during internal audits of their 6 million specimens and that federal authorities were notified in August 1996. The Fish and Wildlife Service agent confirmed that William Duellman, a herpetologist and co-author of the book *Biology of Amphibians* (with Linda Trueb), is a subject of the investigation. Dr. Duellman retired suddenly from the University in December, 1996. In 1979, Duellman was fined by the U.S. Fish and Wildlife Service for illegally importing reptiles from the Galapagos Islands, Ecuador, according to the news report. [January 11, 1997, <<http://www.kansascity.com>>]

But why?

Associated Press reports that someone stole a 9-year-old male 25-pound broad-snouted caiman from the San Francisco Zoo. Mike Sulak, the zoo’s curator of collections, said, “Whoever took it either knew what they were doing or was extremely stupid.” [March 3, 1997, from Allen Salzberg]

Smoking can be hazardous

A Dutch tourist returning from a Caribbean vacation was shocked when authorities found a drugged iguana in his suitcase at customs control in Rotterdam, Netherlands. Authorities believe that the iguana was planted in his luggage for confederates to retrieve later. The man had gone through the “anything to declare” lane at Customs because he had too many cigarettes. [Reuters newswire, February 22, 1997, from Allen Salzberg]

Reward for information

The butchered remains of 10 gopher tortoises were found in a dumpster near a trailer park in Tampa, Florida. They had apparently been killed and cut open for their meat. Wildlife officials are offering a \$500 reward for information on who killed (or ate) the tortoises. [St. Petersburg, FL *Times*, March 11, 1997, from J. N. Stuart; *The Gainesville Sun*, March 12, 1997, from Ken Dodd]

A hop in the right direction

The Albuquerque *Journal* reports that the New Mexico House of Representatives passed a bill to protect 122 species of native reptiles and amphibians from being taken or killed for commercial purposes. The State’s Game Commission will prepare regulations to go with the bill if it is passed by the New Mexico Senate. [20 February 1997, from J. N. Stuart]

Bud-wiser! Bud-wiser!

In a February 10, 1997, reply to a letter by Steve Grenard, <Budmaster@budweiser.com> wrote: “Anheuser-Busch will not sponsor any rattlesnake sacking competitions [at rattlesnake roundups] this year. We were a participating sponsor in previous years, but have decided to place our sponsorship funds with other events. Anheuser-Busch has a long-time commitment to protection of wildlife and to preserving the environment. We do not knowingly participate in any events that are contrary to this corporate philosophy.” <<http://www.xmission.com/~gastown/herpmed/med.htm>>

Live or Memorex?

Contributor Rick Dowling sent an article about the Opp, Alabama, rattlesnake roundup and a letter. The article is the usual “y’all come down now, y’hear” press release thing, the photo shows spectators far too close to the snakes, hand-held venomous animals and so forth. Rick writes: “It is interesting to note that the article states that most of the snakes are let go after the show. Tonight on WSFA, which is the local NBC affiliate out of Montgomery, Alabama, the [reporter] stated that the snakes are killed after the show for their skins and the meat which is frozen for next year’s show. Someone is sure not telling the truth!” [*The Montgomery Advertiser*, February 27, 1997]

Shot for watching frogs

The Durban South Africa *Sunday Tribune* reports: “Student shot on frog research. An Institute of Natural Resources student was shot in the stomach at the Merrivale shooting range while conducting research into frogs last night. An ordinary night out watching the nocturnal habits of these slippery creatures ended with serious consequences when [the 23-year-old man] was shot in the stomach. A Medical Rescue International spokesman . . . said [the student] was taken to Medi City clinic in Pietermaritzburg. His condition was stable. [The victim] was in the company of University of Natal students when shots unexpectedly rang out. Police confirmed the incident and said that no one had owned up to the shooting.” [March 2, 1997, from Lynn Raw and Allen Salzberg]

Mystery disease decimates frogs

“Queensland’s principal conservation officer, Ian Gynther, has publicly confirmed that the cause of death in a massive mortality among frogs in the state is still unknown. Since May 1996 there has been a ‘wave’ of frog deaths in at least 6 of the 200 species in southeast Queensland. While a fungal infection and a protozoan infestation in two specimens have been determined, Gynther said that these causes seemed unlikely to be responsible for all the deaths. Further tests are investigating the possibility of viral infection and toxin exposure. Australia has experienced similar high mortalities in frogs in the past. But generally these have occurred at high elevations, not in coastal plains. University researchers and conservation officials are calling for increased funding of research on the frog losses.” [*The Weekend Independent* (on-line), University of Queensland, Brisbane Australia, March 21, 1997, from Dorothy B. Preslar and Steve Grenard]

Vacation hotspots

According to *Men's Health Magazine* [April 1997], the top ten most dangerous golf courses around the world include the Lost City Golf Course, Sun City, South Africa. Its 13th green has a stone pit filled with crocodiles. Big ones can be up to 15 feet long. Other risky fairways include one in Zimbabwe where the greens are targets for insurgents' mortar shells, a course in California built on a poorly buried landfill, and the Singapore Island Country Club, Singapore, where in the 1982 Singapore Open, pro Jim Stewart encountered a ten-foot cobra which he killed, only to watch in horror as another reportedly emerged from its mouth. [from Allen Salzberg]

Do you have giant tortoises?

"Confirmation of the survival of 'extinct' giant tortoises from the granitic islands of Seychelles has just been announced by the Nature Protection Trust of Seychelles [NPTS]. Giant tortoises were common on all islands in the western Indian Ocean until Mauritius was colonized in the 1600s when increasing numbers of explorers and settlers visited the Seychelles islands and removed or killed the tortoises in vast numbers. By 1840, the only surviving giant tortoises in the wild were those on the inhospitable Aldabra atoll, some 700 miles away and unrelated to the Galapagos giant tortoises in the Pacific. . . . In the Indian Ocean the Aldabran tortoises were saved by appeals for the conservation of Aldabra by eminent scientists of the time, including Charles Darwin, and the leasing of the island by Lord Walter Rothschild who maintained a passionate interest in the biology and conservation of these animals. It has generally been assumed that only the Aldabran species survived this overexploitation. . . . It has been suggested that some Seychelles granitic island tortoises survive in captivity. The report of oddly shaped captives prompted NPTS to examine and identify the living tortoises. Examination of museum specimens . . . confirmed that some living tortoises do show characteristics of the supposedly extinct species. This was supported by genetic studies . . . at Aberdeen University's Zoology Department [which] shows that there are in fact two different species of supposedly 'extinct' Seychelles giant tortoise. The genetic work has identified one pair of one Seychelles species and four pairs of another. These species, thought to have been driven to extinction 120 years ago, are now the subject of a conservation program being carried out by NPTS. This includes searches for further living individuals in captive collections around the world. The NPTS is bringing the Seychelles giant tortoises together into a captive breeding program. To ensure the survival of these critically endangered species the NPTS is raising the funds needed to purchase the tortoises through an adoption scheme. Under this scheme anyone interested in helping to save the species from extinction can adopt a tortoise, wholly or in part, and will be kept informed of the progress of the captive breeding program. The NPTS would be pleased to hear from everyone interested in supporting their efforts to save these critically endangered species. Further information can be obtained from: The Nature Protection Trust of Seychelles, 53 River Lane, Cambridge CB5 8HP or contact Justin Gerlach <klc1001@esc.cam.ac.uk>." [from Allen Salzberg]

New, stronger TED rules

The Center for Marine Conservation reports that new rules from the National Marine Fisheries Service issued December 19, 1996 "significantly increase protection for threatened and endangered sea turtles in the Gulf of Mexico and the South Atlantic. They ban so-called 'soft' turtle excluder devices (TEDs), require TEDs in large 'try' nets . . . and modify bottom-opening TEDs to ensure turtles can escape from the nets. In issuing the rules, NMFS . . . refused to bow to withering pressure from implacable opponents of endangered species conservation and the fishing industry." [*Marine Conservation News*, Spring, 1997, from Kathy Bricker]

Super new publication

Special thanks to Craig Hassapakis for sending me a copy of Volume 1, Number 1, of his long-awaited new journal *Amphibian and Reptile Conservation*. It is a great first effort. The cover shows an individual of the presumed-extinct Golden toad (*Bufo periglenes*) from the Monteverde Cloud Forest Reserve in Costa Rica. For more information contact the journal at A&RC, 2255 N. University Parkway, Suite 15, Provo, UT 84604-7506 or <<http://www.byu.edu/~arcon/>>.

Spring, glorious spring

"But on this night a slight rain fell, and the temperature hovered in the low 50s. . . . The hikers smelled the swampy, earthy aroma of decaying vegetation. They saw their breath hang like smoke in their flashlight beams. They heard the calling of frogs, spring peepers peeping and chorus frogs trilling, like a thumb running down a comb." [*Richmond Times-Dispatch*, March 6, 1997, from Mr. Laverne A. Cope-land]

Thanks to those who contributed this month and to David L. Hardy, Ardis Allen, Mark Witwer, Mike Plummer and E. A. Zorn for stuff I enjoyed reading but couldn't figure out how to fit into this column. You can contribute, too! Send whole sheets of newspapers/magazines with date/publication slug and your name on each page (or cut out the articles if you're feeling sculptural) and mail to me: Ellin Beltz, 1647 N. Clybourn Avenue, Chicago, IL 60614-5507. Letters only to my new E-mail address <E-Beltz@neiu.edu>. Don't complain there's "nothing to read in the *Bulletin*"; contribute here or send us an article!



The Phib File Amphibian Q&A by Dave Golde



Finally I have received some great questions from readers. Please keep them coming.

Earthworms as Food

Hi, Dave. Here's my problem: I have a Bufo guttanolola (?). It is a large half-pound toad. I feed him four nightcrawlers and four crickets on Mondays. He has no problem with the crickets — he flicks out his tongue and nabs them. However, the nightcrawlers sometimes present a strange problem. I will dry them off with a napkin, but sometimes when he flicks out his tongue to catch them, they do not stick. Then he has to "reswallow" his tongue as though it gets stuck in his jaws. He gives up trying to catch them and just puts his head down and grabs them which seems to work just fine. Any suggestions as to what I can do to solve this problem?

*Also, I am glad you confirmed something I have noticed. My toads hop to the front of their cage when they see me; they know I feed them on Mondays. If I catch a loose cricket they always get it. You're right, they are "amazingly responsive to humans" (see Phib File, Bull. Chicago Herp. Soc. 32(2):34).
Randi Scott, Northbrook, IL.*

Actually, even though they sometimes present difficulties in consumption, earthworms are probably the best food item for large anurans. Earthworms are a great source of protein, and nightcrawlers actually contain a small amount of calcium. To resolve your problem of the toad having difficulty in consuming the worms, it usually helps to chop the worm's head off or cut it up into segments. An intact worm has strong muscles by means of which it can change its shape, texture and consistency in a fraction of a second. Such contortions can often send it flopping out of a hungry mouth. If the worm's head is removed, or it is cut into segments, it loses the ability to contract so effectively, therefore making it easier to swallow, or zap up with a tongue.

As for blotting the worm with a napkin, this actually tends to make it slimier. When its existing mucus is removed, its mucus glands immediately go to work to produce more. And fresh mucus can be lot slimier than existing mucus in much the same way that glue straight from the bottle is a lot harder to work with than glue which has been exposed to the air for a few minutes. Also dirt, roots, and other debris clinging to the worm not only give the toad's sticky tongue something to adhere to, but also add

nutrients to the meal.

You also mentioned you feed your toads escaped crickets. This is not a good idea. It would not be unlikely for a house cricket to survive a trek through some spilled kitchen cleanser, or a meal of soap, for example. This in turn could harm your toads. Better safe than sorry — discard escaped crickets. Thanks for the question and comments.

Fire-bellied Toads

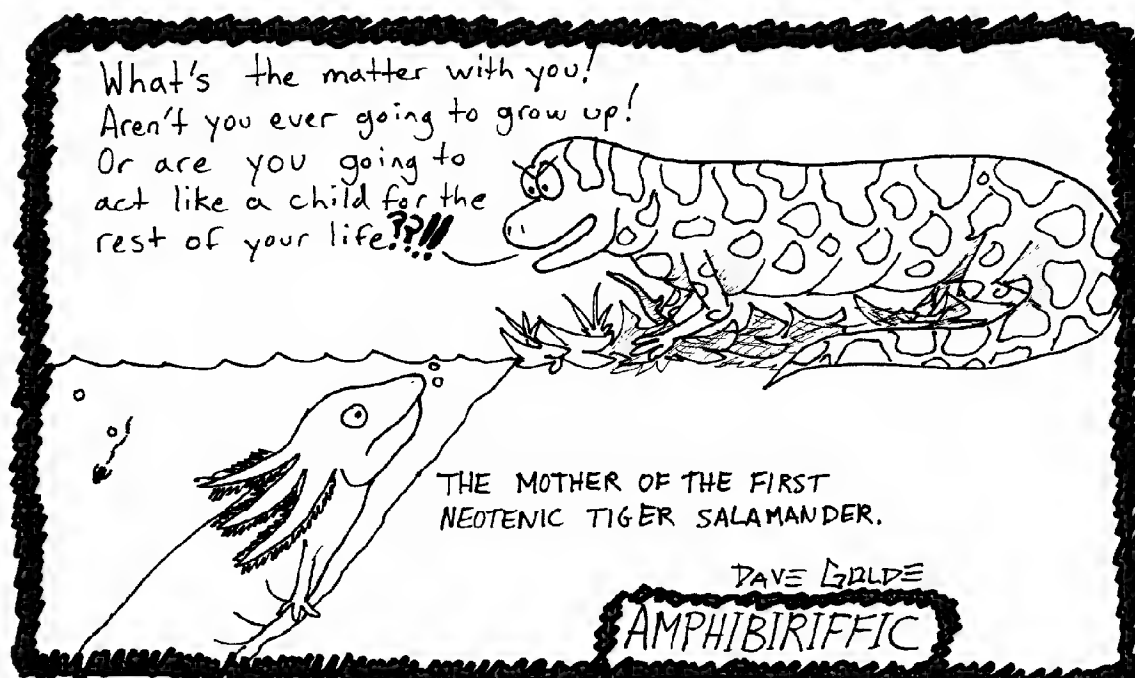
I keep two fire-bellied toads (Bombina sp.) in a ten-gallon tank. I have several questions about their care. Is there an easy way to determine gender? They are both very vocal, especially at night. Is this normal, or are they in distress? Besides crickets, can you recommend other foods? I really enjoy your column! Ben Vallone, Age 6, Chicago, IL.

Well, Ben, your first question is actually answered by your second question; only male anurans (frogs and toads) call, so there is no doubt both your specimens are male. In general, the physical difference between male and female fire-bellied toads is that when they are compared side by side the males appear to be more slender, and longer, than the stout, rounder females. The only positive way to tell males from females though, without lab analysis, is by their call. If the specimen calls, it is a male. Sometimes by gently but firmly pinching the anuran in question just behind the arms you can get a "release call" response, confirming it is a male. With some anuran species there is noticeable pigmentation on the throat and/or the nuptial pads on the outer surface of the thumbs (the nuptial pads get very dark around breeding season).

In answer to your second question: If both toads are vocalizing at night, this is a good indication that they are healthy and comfortable in their surroundings. The calls they are making are intended to attract a mate, which means they are in healthy breeding condition.

Finally, in answer to your third question, fire-bellies will eat virtually anything, so long as it moves and it fits in their mouth. Besides crickets you could try waxworms, meal worms, small earthworms, flies, spiders, grasshoppers, sowbugs and pillbugs. You may even want to try tossing some floating fish-food pellets in front of them. With all insects to be fed, be sure they come from a source free of chemicals and pesticides.

Cultivated crickets are



probably the best live food for your toads; everything else should be supplementary. Crickets should be offered with a calcium and vitamin supplement sprinkled on them once every two weeks. The crickets should also be “gut-loaded” prior to feeding by offering them bits of fruits and vegetables and/or crushed rodent-food. The nutrients in the crickets’ meal will be passed on to your toads. Because these toads have a high metabolism, they should be fed almost daily in small quantities. If fed and cared for properly your fire-bellied toads can probably live up to ten years, and possibly longer. (Readers: I realize my wording is a bit complex for a six-year-old, but I’m sure his parents can break it down for him.) Thanks for the great questions! It is good to see that people of all ages are enjoying my column.

Local Amphibians

I have enjoyed your “Phib File” in the CHS Bulletin for the last few months. I am a long-time CHS member who is disturbed that there has been a decreasing number of articles dealing with herpetile husbandry of any sort in the Bulletin, so your column has been a pleasant change. I do not keep amphibians in great numbers. Currently I have a tiger salamander and an American toad, but I have kept a variety of species over the years, and have found them to be interesting pets.

Your article on housing tiger salamanders occasions this letter. My best successes with keeping ‘phib’s healthy for long periods of time have involved aquaria and sweater boxes of several types, but using discarded carpet foam padding as a substrate. I rinse the pads in dechlorinated, aged water several times before using them (I also do this when I clean the cage). A variety of native species have done well in these setups. The only problem is that the tiger salamanders and toads both tend to burrow under the foam. After a few months it is shredded, and needs to be replaced.

A few months ago, I adapted several ideas from different sources. Currently I am keeping my salamander and toad in a five-gallon tank with two inches of gravel on the bottom. On top of the gravel I have placed a piece of air conditioner filter; and on top of this I have layered rinsed moss I bought at the pet store. I fill the tank with aged water to the top of the gravel; occasionally I mist the cage. I have not cleaned the setup in about three or four months, but both animals are doing fine. I will clean the cage once the weather warms up enough for me to work outside.

I have enclosed an article about ‘phib’s from the most recent Illinois Audubon Society bulletin. The remarks about the status of the various species interest me. A dozen or so years ago I surveyed the herptiles of DuPage county in conjunction with the Forest Preserve District of DuPage County, the Morton Arboretum, etc. Since then I have noticed a decline in the number of sites at which animals can be found and the number of animals that can be found. In fact, except for tiger salamanders and American toads (and possibly chorus frogs), I have been unable to find any amphibian species, except on protected land, for several years. Bullfrogs are probably an exception if I were to go looking.

This raises some questions. Are you aware if it is possible to collect spotted, blue-spotted, and marbled salamanders at any sites within a few hours drive of Chicago? Have you ever seen these species in pet stores or, at swap meets? Could you report on breeding these species in captivity without injections, etc.? Now that I’ve bred snakes and lizards, I think salamanders would be fun. Thanks for your column. John Cebula, Glen Ellyn, IL.

I have kept my amphibians in much the same way you do. I have found that both carpet foam and moss beds present several problems.

Foam pads are very difficult to clean thoroughly and tend to build up excessive amounts of harmful bacteria. Unless the foam pad is replaced at least monthly, you’re running the risk of toxins building up to a lethal level. The shredded bits may easily cause an impaction if ingested by a clumsy toad or salamander during feeding. This method can work well if the pad is soaked and rinsed in very hot water, once a week, and replaced at least once a month. One interesting method I have used for tiger salamanders is six-inch-thick furniture foam, cut to fit the tank, and with tunnels, channels, and coves cut into it. This allows you to view the salamanders’ subterranean activities if coves and channels are alongside the glass. But once again, this is difficult to keep clean and needs to be replaced frequently.

The dry moss bed method can be dangerous too. There have been clinical studies that show commercially raised or collected dried moss may carry many mold and fungus spores, which can actually cause respiratory infections in humans and animals. Moss is also likely to be swallowed during feeding, which may cause impaction. Dried moss also promotes bacterial and fungal growth, as well as an increase in acidity, making the amphibians’ body slime more permeable to infections. The only type of moss I suggest for live herps is live moss beds (which can be acquired by some mail order garden or scientific supply distributors, or for native species, off of the forest floor). Live moss beds are less apt to be swallowed, they promote and maintain humidity within a terrarium, and they can add a nice natural touch. However, moss beds should not be used for burrowing species; they will dig it up to hide beneath it. The best ground cover for burrowing species is dead leaves and slabs of wood or bark.

As for your observation about local amphibian populations, I too have realized, even in protected areas, in recent years, populations seem to be dwindling. I believe some of these declines can be attributed to the introduction, and voracious appetite, of the bullfrog (*Rana catesbeiana*) in vernal ponds where they did not exist previously. Some of the bullfrog problem can be attributed to people releasing their pet store tadpoles once they become frogs. The recent increase of bullfrogs can also be attributed to floods bringing or forcing them into vernal ponds. Once bullfrogs enter a closed ecosystem (pond, lake, etc., with no outlets or variation in shoreline) they wreak havoc on the wildlife, by eating everything and anything that moves, and will fit into their big fat heads. The increase in acid rain, floods, run-off, mosquito control meth-

ods, draining of wetlands, and the forest preserve districts clearing out forest litter and removing non-native plants and trees, are all major contributors as well.

The only amphibian species I ever found in our area that were not on protected land have been bullfrogs, American toads (*Bufo americanus*), Fowler's toads (*Bufo woodhousii fowleri*), western chorus frogs (*Pseudacris triseriata*), and a single eastern tiger salamander (*Ambystoma tigrinum*).

As for the species you have specifically mentioned, I have found only a single spotted salamander (*Ambystoma maculatum*) in the Palos area nearly three years ago. I have never found a marbled salamander (*Ambystoma opacum*) in our area, although 'Phib Club member Bill Leja reported a single specimen from the Palos area several years ago. I do believe there are several populations of marbled salamander in the Indiana Dunes area and in southwestern Michigan. Blue-spotted (*Ambystoma laterale*) still occur, in great numbers in many areas, although they tend to become easily concealed beneath leaf litter, when logs are scarce, therefore they are sometimes difficult to find. Yet all the species you mentioned, as far as I know, can only be found in protected areas (within the Chicagoland area), but if you head about 100 miles south, or southeast, of Chicago, you can probably find some pristine habitat on private land (but be sure to ask for permission, especially if the property is posted) where you can find the species you are interested in. Also railroad rights-of-way through protected areas are private property, and if any non-threatened/endangered species are found there, legally they can be collected, but not for commercial purposes. The following is a checklist of amphibians that have confirmed populations in Cook County:

- Bullfrog (*Rana catesbeiana*)
- Northern leopard frog (*Rana pipiens*)
- Green frog (*Rana clamitans melanota*)
- Western chorus frog (*Pseudacris triseriata*)
- Northern spring peeper (*Pseudacris c. crucifer*)
- Mudpuppy (*Necturus m. maculosus*)
- Eastern tiger salamander (*Ambystoma t. tigrinum*)
- Spotted salamander (*Ambystoma maculatum*)
- Blue-spotted salamander (*Ambystoma laterale*)
- Central newt (*Notophthalmus viridescens louisianensis*)

Other amphibian species that may possibly occur in Cook County are as follows:

- Wood frog (*Rana sylvatica*)
- Plains leopard frog (*Rana blairi*)
- Blanchard's cricket frog (*Acris crepitans blanchardi*)
- Gray treefrog (*Hyla versicolor*)
- Cope's treefrog (*Hyla chrysoscelis*)
- Fowler's toad (*Bufo woodhousii fowleri*)
- Marbled salamander (*Ambystoma opacum*)
- Four-toed salamander (*Hemidactylium scutatum*)
- Redback salamander (*Plethodon cinereus*)

These are species I have heard unconfirmed reports of or that range into or near, Cook County. The Conant/Collins field guide has the most accurate range maps for general reference.

If you really wanted any of these species (excluding the protected four-toed salamander), I can usually either provide some specimens for you or give you some direction as to where to find, obtain or see some. Unfortunately I have seen many of the species listed above for sale at swap meets and in pet stores. Most of them were probably collected in protected areas, which I guess is another reason we can tack onto what is causing declines.

As for captive breeding of the species you mentioned, or any local salamander species, I am sorry to say it is probably a lost cause. Reason being, most all ambystomid salamanders will only breed in the ponds they originally were born in. They also must go through an aestivation, brumation, and rainy period to stimulate breeding, which is somewhat difficult to achieve in captivity. Even if you were successful you would have anywhere from 200 to 10,000 larvae for each female, which would be eating each other in cramped aquarium surroundings.

A wide, shallow, outdoor, pond is probably the only way to breed ambystomid salamanders successfully (with special requirements for autumn breeders such as the marbled salamanders, which lay their eggs in depressions that will eventually fill with water). The livestock for such a project would have to come from egg masses hatched within the constructed pond, in which case it would probably be at least two years before they started to breed in the pond. The area surrounding the pond would have to be comprised of expansive, damp, shady woodland with a lot of ground cover in the form of leaf litter and fallen logs.

On the other hand plethodontid salamanders, when cycled properly, given enough space, and somewhat natural surroundings, may breed naturally in a captive situation. Because most plethodontid salamanders lay eggs on land that hatch directly into terrestrial offspring and produce relatively few offspring (which are much more manageable than thousands), plethodontid salamanders would be easier subjects to breed in captivity.

If you wish to experiment with breeding salamanders, I would suggest starting out with fire salamanders (*Salamandra salamandra*), for they are easy to acquire in significant numbers and captive propagation is well documented. I can give some guidance on where to obtain some very nice specimens.

I appreciate your interest in my column and I sincerely thank you for your great questions and kind comments. I hope that you will become an active member of the amphibian club. Our goals are right up your alley. The CHS Amphibian Club is devoted to conservation, preservation and propagation of U.S. amphibians (as well as some other species) in the wild, occasionally touching on captive husbandry. I hope to see you at future meetings, and to hear from you again. Thanks.

► Anyone who has a pet store (or swap) herp (bullfrog, red-eared slider, etc.) of any kind, that you can no longer care for, please DO NOT release that animal(s) so it can be "happy." Any species you collected, and would like to release, release it in the exact spot in which it was found, unless it was exposed to foreign species, or domestic afflictions of any kind (in that

case it should not be released). A released specimen can wreak havoc on a fragile ecosystem, and wipe out entire populations. This applies to fish and all other animals, and plants, as well. If you must rid yourself of any herp (even a single tadpole) contact either CHS adoptions, or me. Cooperation, support and enforcement of this is greatly appreciated.

► I strongly advise against purchasing any native species from swaps or pet stores, especially if the specimens are victims of obvious large-scale collection. Our state, as well as most others do not allow commercial collection (without special permits), and many do not allow possession or removal of any species native to that state, even from private land. Many of these species that show up in the pet trade or at swaps are collected off of protected land, this is illegal! The herps are usually kept in cramped and filthy surroundings, and not fed properly. The people who do these things should be reported, not supported.

► I believe anyone who has the time, desire, and facilities to do so should try to breed or farm salamanders, especially large ambystomids, which seem to be the subject of large-scale collection for the pet and bait trade. Breeding and farming of tiger salamanders and related species (I do realize there are some farms for this purpose) will help to reduce the demand for wild-caught animals, helping to protect and preserve wild

populations.

► For those of you who are mutation or salamander fanatics, I have recently acquired a most interesting specimen of spotted salamander (*Ambystoma maculatum*). This particular specimen has bright orange spots, normally found on the head of a small percentage of specimens, all the way from its head to the tip of its tail. The specimen is a full grown adult female (as far as I can tell). If anyone has heard of such a specimen, would like to see, or photograph it, please contact me. If she stays alive and healthy you will be seeing her at future herp society functions, and possibly books and magazines.

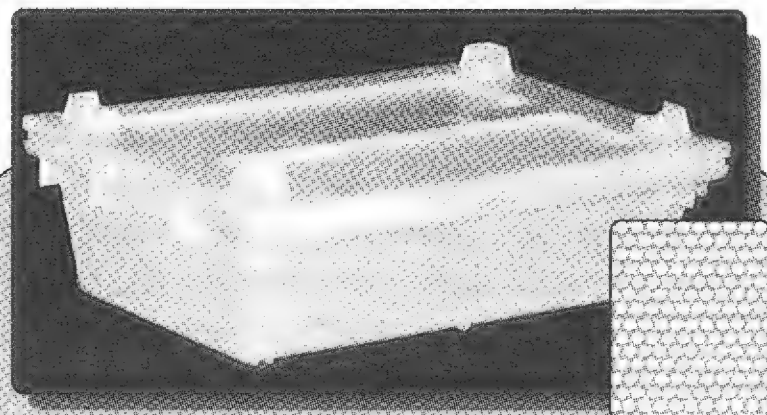
► As of this writing I am preparing a salamander hunting trip to the Appalachians and surrounding areas. I will have many live specimens upon my return. If you would like to schedule a photo session, or an educational salamander exhibit or program, feel free to contact me. I am always looking for new and unusual U.S. salamander species. Please contact me if you have any you want to give up, or know where to get some.

Thanks to everyone who submitted questions this month; please keep them coming. Any comments, tidbits, information, etc., related to amphibians is greatly appreciated. Please write or call me at 4506 Howard Street, Skokie IL 60076, (847) 679-1530. Thanks!!! Dave Golde.

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Herpetology 1997

In this column the editorial staff presents short abstracts of herpetological articles we have found of interest. This is not an attempt to summarize all of the research papers being published; it is an attempt to increase the reader's awareness of what herpetologists have been doing and publishing. The editor assumes full responsibility for any errors or misleading statements.

SPEED AND ENDURANCE OF GRAVID SNAKES

M. V. Plummer [1997, Copeia (1):191-194] notes that both speed and endurance have been shown to be impaired in gravid garter snakes of two species, but that data on locomotor performance were not available for any other gravid viviparous snake species, and no such data were available for an oviparous species. In this paper, he examines whether gravid specimens of the rough green snake (*Opheodrys aestivus*), an oviparous species, show decreased locomotor performance relative to nongravid individuals. Locomotor ability was measured on a 2 m linear race track as follows: a snake was released at the starting gate where its head was detected by an infrared sensor; the snake was stimulated to crawl rapidly by prodding it at the base of the tail with a small hand-held brush; as soon as the snake's head passed through the finish gate where it was detected by another infrared sensor, the snake was collected and immediately placed at the starting gate for another trial. Ten such trials in rapid succession were conducted on each snake. Results showed that crawl speeds of gravid snakes were significantly slower. However, in contrast with previous results on two species of garter snakes, the data suggested that locomotor endurance in green snakes was not affected by gravidity. The author suggests that this discrepancy may reflect differences in the methodology used to measure endurance.

MANTELLA FROGS AND THEIR SKIN ALKALOIDS

J. W. Daly et al. [1996, Am. Mus. Novitates 3177] note that the endemic Madagascan frog genus *Mantella* is demonstrably convergent with the aposematic Neotropical poison frogs of the family Dendrobatidae in the presence of a variety of similar skin alkaloids. There is also convergence in a few other traits, notably color pattern. The authors surveyed alkaloids in skin extracts of 9 of 11 currently recognized species of *Mantella*, revealing the presence of about 100 compounds. The structures of many of these were known, having been isolated previously from dendrobatids. However, about 30 alkaloids from *Mantella* were found to represent new compounds of unknown or uncertain structure. Levels of alkaloids ranged from relatively low (*M. betsileo*, *M. expectata*, *M. laevigata*) to moderate (*M. aurantiaca*, *M. crocea*, *M. pulchra*) to high (*M. baroni*, *M. cowanii*, *M. viridis*). However, there was variation in levels for different populations of the same species. The authors assert that assumptions of extraordinary variability in *Mantella* color patterns have proven unfounded (unlike the situation in *Dendrobates*), and most species are readily identified in life by coloration alone. The authors resurrect the name *Mantella baroni* Boulenger, 1888, from synonymy for a widespread upland species previously known as *M. madagascariensis* (Grandidier, 1872). They accept use of the name *M. betsileo* (Grandidier, 1872) for a widespread lowland species with reservation because the type locality falls outside the known distribution and habitat.

SICS IN RATTLESNAKES RESCUED FROM ABUSIVE HUSBANDRY CONDITIONS

C. Busch et al. [1996, Herpetozoa 9(3/4):99-104] report that six northern Pacific rattlesnakes, *Crotalus viridis oreganus*, known to have experienced poor and abusive husbandry, were acquired by Woodland Park Zoological Gardens (Seattle, Washington) and shipped to the University of Colorado soon after. The snakes were tested for their tongue flicking frequency in the scope of strike-induced chemosensory searching (SICS) within one month of arrival at the University of Colorado and exhibited very low frequency values by comparison with data from rattlesnakes kept under state-of-the-art husbandry conditions. One year later tongue flicking frequency was again measured and it was significantly higher than during the first test, but still well below "normal." Hence, it appears that this behavior recovers when the snakes are exposed to good husbandry conditions, but years, not weeks or months, may be required for full recovery.

PRAYING MANTIS FEEDS ON SAND LIZARD

R. Jehle et al. [1996, Herpetozoa 9(3/4):157-159] report on an instance of predation by a praying mantis, *Mantis religiosa*, on a juvenile sand lizard, *Lacerta agilis*. The observation was made in October 1995, south of Lake Neusiedlersee, between Fertöboz and Hidegseg, west Hungary. When first detected, the mantis was sitting on a plant with the sand lizard in its pincers. The insect was eating from the anterior part of the lizard's body; the head and forelegs of the reptile were already missing. Within half an hour, the praying mantis had eaten up most of the trunk, leaving nothing but the vertebral column. Two black-and-white photos of the incident are included.

LABORATORY VERSUS FIELD MEASUREMENTS OF RACERUNNER BEHAVIOR

B. W. Witz [1996, J. Herpetology 30(4):498-506] measured in the laboratory several related behavioral characteristics of the widely-foraging teiid lizard *Cnemidophorus sexlineatus*, using domestic crickets as prey. Foraging behaviors of individuals observed in the lab were compared with those of free-ranging individuals and individuals observed in a semi-natural field enclosure. In the laboratory, both attack and ingestion rates by the predator increased with prey densities from 0.25 to 1-2 prey/m² and reached a plateau of 4-5 prey attacked per hour at the highest prey densities. Attack rate, consumption rate, and several other behavioral variables (foraging velocity, handling time, move rate, move duration) differed between field and laboratory. Many of these differences may be explained by an increased edge effect in small, laboratory test arenas. The authors conclude that using functional response information obtained in the laboratory to predict the predator/prey dynamics of free-ranging, widely-foraging lizards such as *Cnemidophorus sexlineatus* should be done with caution.

NEW SPECIES OF LEAF-TOED GECKO

D. A. Good et al. [1996, African J. Herpetology 45(2):49-58] describe the Karoo leaf-toed gecko, *Phyllodactylus braacki*, a new species of small, rock-dwelling *Phyllodactylus* from the upper plateau of the Karoo National Park, Western Cape Province, South Africa. Features of scalation, color and body form, as well as three fixed allozyme differences, distinguish the new species from all other southern African leaf-toed geckos. The new species is morphologically most similar to *P. hewitti* from the southern Cape Fold Mountains, and is genetically most similar to that species and to *P. hexaporus* from the Cedarberg. The new form is allopatric with respect to all other members of the *P. lineatus* complex, although *P. lineatus* reaches its easternmost and inland limit on the lower plateau, only a few airline kilometers away, but nearly a vertical kilometer lower in elevation. The authors present allozyme and genetic distance data for all seven species in the *P. lineatus* group. *Phyllodactylus gemmulus* is the sister taxon of the remainder of the group, with *P. lineatus* as the sister taxon of the clade (*Phyllodactylus braacki* + *P. essexi* + *P. hewitti* + *P. hexaporus* + *P. rupicolus*). The authors suggest that these last five species appear to have diverged from each other almost simultaneously, perhaps due to a climatic change isolating ancestral populations approximately 2.3–4.1 million years ago.

GROWTH RATE AND AGE OF LOGGERHEAD MUSK TURTLES

D. Onorato [1996, J. Herpetology 30(3):301-306] marked a total of 482 loggerhead musk turtles, *Sternotherus minor*, at Rainbow Run, Marion County, Florida, between 5 January 1990 and 27 August 1992. Sex-specific and size-specific growth rates (plastron and carapace length) were determined using data from a mark–release–recapture study. Growth rates decreased with increasing carapace and plastron lengths, with no significant differences in specific growth rates between males and females. Ages of all marked turtles were estimated using a von Bertalanffy growth equation calculated from the recapture data on carapace lengths. Age estimates for *S. minor* were then used to determine the age distribution of the population at Rainbow Run. Young *S. minor* of five years or less comprised over 65% of the population. However, it also appears that some of these turtles reach ages of 21 years or more.

TAXONOMY OF BAJA CALIFORNIA EUMECES

L. L. Grismer [1996, Amphibia–Reptilia 17(4):361-375] reports that an analysis of scalation, color pattern, and distribution of *Eumeces skiltonianus* and *E. lagunensis* in Baja California indicates that these taxa are discretely diagnosable from one another and allopatric. In the context of an evolutionary species concept, they are considered to be separate species. New records extend the range of *E. lagunensis* 220 km to the north in central Baja California. An erroneous report on the southern extent of *E. skiltonianus* in northern Baja California is corrected, restricting its southern distribution 145 km further north than previously reported.

INCIDENCE OF TWINNING IN TURTLES

J. K. Tucker and F. J. Janzen [1997, Copeia (1):166-173] report that 10 of 4943 eggs from the red-eared turtle, *Trachemys scripta elegans*, and two of 1289 eggs from the snapping turtle, *Chelydra serpentina*, contained twins. There was no significant difference between species in twinning rate per egg. However, 10 of 423 (2.4%) female *T. s. elegans* produced twins, whereas two of 29 (6.8%) female *C. serpentina* produced twins. The 10 twin-producing female *T. s. elegans* were larger both in plastron length and body weight and laid larger clutches than did 394 other females that did not produce twins. Estimates of twinning incidence from previously published reports revealed interspecific variation in twinning rates. Methodological differences between post hoc studies of unhatched eggs where the fate of each egg is not known may account for some of the interspecific variation. The authors tested the hypothesis that twinning is random by comparing clutch size and twinning rate per clutch. If twinning is random, then clutch size and twinning rate per clutch should be positively correlated. The resulting correlation was positive but not statistically significant. The authors suggest that twinning is detrimental because surviving twin hatchlings of *T. s. elegans* were significantly smaller both in carapace length and mass than their siblings, and twinning did not produce more surviving hatchlings.

COURTSHIP IN FIRE-BELLIED NEWTS

M. Sparreboom and M. M. Faria [1997, Amphibia–Reptilia 18(1):27-38] observed courtship of the Chinese fire-bellied newt, *Cynops orientalis* in an experimental aquarium measuring 60 × 30 × 30 cm, with a substrate of polished slate and no leafy aquatic vegetation. They report that courtship behavior of *C. orientalis* resembles that of Japanese congeneric taxa but shows significant temporal differences: the tail-fanning and creeping stages are of relatively short duration and one spermatophore is deposited a few seconds after the male starts to creep. The female loses interest in the male soon after the first spermatophore deposition. Instances of prolonged biting after spermatophore deposition are recorded. Successful insemination was a relatively rare event. In encounters with a potential rival present, a male may slightly alter the timing of his courtship. Observed behavior patterns are compared to the sexual behavior of other species of *Cynops* and *Triturus*.

NEW ELEUTHERODACTYLUS FROM BOLIVIA

I. De la Riva and J. D. Lynch [1997, Copeia (1):151-157] report that *Eleutherodactylus fraudator* is more widely distributed in Bolivian cloud forests than previously known and is very similar to another allied species, which they describe as a new species (*E. pluvicanorus*). In external morphology, the two species appear to be somewhat unusual species of the *E. conspicillatus* group, but their skulls are unlike those of all other described *Eleutherodactylus*. The jaw musculature of *E. fraudator* and *E. pluvicanorus* suggests that these are species of the subgenus *Craugastor*, otherwise known from Middle America and extreme northwestern South America.

WINTER TEMPERATURES IN PAINTED TURTLE NESTS

G. C. Packard [1997, *Herpetologica* 53(1):89-95] used miniature dataloggers during the winter of 1994–1995 to measure temperatures inside 14 nests containing hatchling painted turtles (*Chrysemys picta*). The study was conducted at the Valentine National Wildlife Refuge in northcentral Nebraska (1) to assess variation in temperature within and among nests, (2) to determine the duration of exposure of hatchlings to subzero temperatures, and (3) to evaluate survival by hatchlings in relation to variation in the thermal environment. Diel cycles in temperature were evident in most nests, even during the coldest period of winter when temperatures in several nests declined to minima between -9°C and -11°C . Temperatures in nests were continuously below the equilibrium freezing point for body fluids of turtles for intervals ranging from several days to 2 weeks in January and again in February. More than 50% of hatchlings survived in 13 nests, and all died in one. The nest in which all the turtles succumbed was not the nest in which the most extreme temperatures were recorded. The study confirms that hatchling painted turtles overwintering in the field commonly withstand lower body temperatures than are known to be tolerated by any other amniote vertebrate. Moreover, surviving turtles probably withstood exposure to subzero temperatures by sustaining a state of supercooling and not by tolerating freezing of water in the extracellular compartment.

MORPHOLOGICAL DIFFERENCES AMONG TIGER SALAMANDERS

D. J. Irschick and H. B. Schaffer [1997, *Herpetologica* 53(1):30-49] examined variation in external morphological characters in 1353 larvae from 60 populations belonging to four subspecies of the polytypic salamander *Ambystoma tigrinum* and two closely related members of the tiger salamander complex, *A. californiense* and *A. velasci*. Phenotypic differentiation among these taxa is relatively slight, in keeping with their relatively shallow levels of differentiation based on mitochondrial DNA and allozymes. Significant differences among some taxa were observed in size-corrected gill raker number, with smaller contributions from several other variables. Despite this small degree of differentiation, the Mexican ambystomatid, *A. velasci*, the eastern tiger salamander, *A. t. tigrinum*, and to a lesser extent the California tiger salamander, *A. californiense* form distinguishable morphological groups, while the remaining taxa (*A. t. mavortium*, *A. t. melanostictum* and *A. t. nebulosum*) differ only slightly from one another. By contrast, the authors found that all size-corrected variables showed large levels of variation among populations within taxa. The causal mechanisms responsible for this among-pond variation are not obvious, although several lines of indirect evidence suggest that a combination of historical gene flow and current natural selection may be required to explain the observed patterns. Taxonomically, our data provide additional support for the interpretation that *A. t. tigrinum* may be a valid taxon at the specific level, while *A. t. mavortium*, *A. t. melanostictum* and *A. t. nebulosum* are almost indistinguishable from one another.

NEW HONDURAN CTENOSAUR

L. J. Buckley and R. W. Axtell [1997, *Copeia* (1):138-150] describe *Ctenosaura melanosterna*, a new species of spiny-tailed iguana from the Aguan Valley and the Cayos Cochinos (Hog Islands) in Honduras. The specific name refers to the black chest and forelegs possessed by members of this species. Its closest phylogenetic affinities are with *C. palearis* from the Motagua Valley in Guatemala with which it has previously been considered conspecific. Previous work on relationships within *Ctenosaura* presented evidence of a clade consisting of *C. palearis* (including the species described herein), *C. bakeri*, and *C. oedirhina*. Data presented here add additional support for this clade. Alternative biogeographic scenarios are discussed, with the conclusion that the current range of these species of *Ctenosaura* in Nuclear Central America probably resulted from the fragmentation of a Caribbean versant distribution. Display behavior of the new *Ctenosaura* and *C. bakeri* involves head shaking unlike that seen in other *Ctenosaura* but similar to *Iguana*. Because of the highly restricted distributions of *C. palearis*, *C. bakeri*, *C. oedirhina* and the new form, the authors strongly recommend close monitoring of their conservation status.

TWO NEW GENERA OF AFRICAN VIPERS

D. G. Broadley [1996, *African J. Herpetology* 45(2):40-48] notes that the genus *Atheris* Cope (the African bush vipers) has traditionally included a closely related group of forest-dwelling arboreal snakes with prehensile tails, but in 1965 two terrestrial species were assigned to the genus on anatomic grounds. On morphological, molecular and ecological grounds, Broadley erects two new monotypic genera to accommodate these two distinctive species: *Proatheris superciliaris* (Peters), of lowland floodplains and *Montatheris hindii* (Boulenger), inhabiting moorland above 3000 m in the Kenya highlands. He formally proposes the tribe Atherini to include the two new genera, together with *Atheris* and *Adenorhinos* Marx and Rabb.

A NEW SPECIES OF TOAD FROM GUATEMALA

J. R. Mendelson III [1997, *Herpetologica* 53(1):14-30] reviews the status of populations of toads of the genus *Bufo* from the Pacific Highlands of Guatemala and southern Mexico. He describes a new species, *Bufo tutelarius*, which occurs at high elevations in the Chimalapas and the Sierra Madre de Chiapas, Mexico, and the Montañas de Cuilco, Guatemala. This species is similar to the widespread, predominantly lowland species *Bufo valliceps*, but it differs by having a smaller tympanum and a poorly developed vocal sac, among other features. The name *Bufo macrocristatus* Firschein and Smith is available for the montane forest toad with long limbs and moderately hypertrophied cranial crests that occurs in wet forests along the Atlantic versants of the Chimalapas and Chiapan Highlands of Mexico and the Caribbean slope of the Sierra de los Cuchumatanes of Guatemala. Both of these species have been often confused with *Bufo cavifrons* in the literature; *B. cavifrons* does not occur east of the Isthmus of Tehuantepec. *Bufo campbelli* is reported for the first time from the countries of Mexico and Honduras.

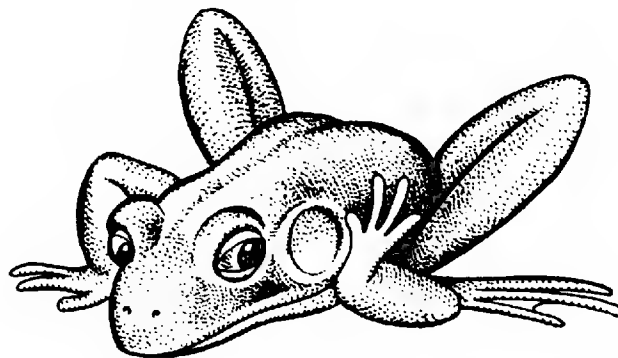
The Tympanum

This note is in reference to the announcement "Animal Kudzu" . . . [HerPET-POURRI. Bull. Chicago Herp. Soc. 32(2):33, 1997] (regarding the Asian rice eels in Georgia).

I am the Director of the Chattahoochee Nature Center where the introduction of Asian rice eels has occurred. The eels have been on our property for a number of years and only positively identified two years ago. Since that time, we have found the eels in a number of our ponds, two of which empty into the Chattahoochee River. We have not, as of March 6, 1997, found the eels in the river; however, not much effort has been made to determine their existence there. The department of natural resources, Georgia, is responsible for the survey and they are planning on sampling once water temperature and weather warms.

It is suspected that the eels were released here by someone discarding an unwanted pet. The eels are in the pet trade. They are also food for southeast Asians, not only in Asia but also here in the U.S. There is considerable concern about this non-native introduction because of the impact on native systems. The eels are predatory and are incredibly adaptable. They breathe air and can crawl across land as a means of recruitment into adjacent wetlands. The eels can withstand drought by burrowing into substrates, and can detect toxins, such as would be used to kill off non-native aquatic species and upon detection of toxins, the eels leave the water and crawl away. We know they feed on crayfish, as captured animals have regurgitated crayfish remains. In aquaria, the eels have also fed on mosquito fish. On two occasions, a great blue heron (bird) has been observed eating eels. We know that there is some predation on the eels taking place, but from our surveys, the eels have incredibly high population densities. In the ponds there are other possible predators besides the heron. They include stinkpot musk turtles, eastern painted turtles, common snapping turtles, and midland water snakes. Other possible predators, common in the area include raccoon, mink, and otter. All of the potential predators, however, do not appear to be keeping the eel population from an apparent high population density. The eels can bite, but are not aggressive towards people. A bite recently occurred at the Center on one of our naturalists who was attempting to retrieve an eel from an aquarium. The 18-inch specimen inflicted a bite on the finger of the surprised person and the eel was lifted from the water firmly attached to their finger. The injury did not require attention and resulted in a very slight laceration on the fingertip.

The greatest thing to come from this is that it can be an example of how a seemingly innocent act of releasing an animal can have severe and devastating effects on the environment. Nature centers are often thought of as "havens" for wildlife and that all creatures would find them a nice place to live. Even though we refuse the release of all animals on our property (we have maximum population densities of all native



species), we go beyond that and even suggest to people who call to euthanize non-native species if they cannot find a suitable foster home for them. On our 130 acres, we have numerous native turtle species, but we also have non-native species like red-eared sliders and Reeves turtles. It is not uncommon to

have other non-native species of birds and mammals dumped on our doorstep. People need to be informed that everyone keeping non-native species needs to be prepared for "What to do with the animal" once the animal has outgrown its welcome. The responsibility is with the owner and should not be placed on Zoos, Nature Centers, State or Federal Fish and Wildlife agencies. The results of irresponsible pet owners releasing animals is of extreme concern, not only at the Chattahoochee Nature Center but in many areas of the country. The end result may well be the fuel for the fires to ban exotics from the pet trade and that will inevitably impact the herp community as well.

I would be happy to answer any questions in regards to the Asian rice eels and keep CHS updated as more information becomes available. Sincerely, **Greg Greer, Executive Director, Chattahoochee Nature Center, 9135 Willeo Road, Roswell, GA 30075, (770) 992-2055.**

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Unofficial Minutes of the CHS Board Meeting, March 14, 1997

The meeting was called to order at 7:52 P.M. Board members Greg Brim, Ron Humbert, Ty Park, Audrey Vanderlinden and Jenny Vollman were absent.

Officers' Reports

The minutes of the February board meeting were not available. The unofficial minutes from the *Bulletin* were read instead.

The Treasurer's Report was reviewed and approved.

Current CHS membership is 1,250. John Driscoll announced the formation of a committee to explore various issues, including strategies to increase membership, dues, revising the Society's Care in Captivity publication, and updating membership brochures. He will announce the date and time of this committee's first meeting at the next general CHS meeting. Anyone interested may contact John.

Vice-president Jack Schoenfelder has scheduled speakers and/or programs for all CHS general meetings through August.

Committee Reports

1997 ReptileFest: Plans for ReptileFest are moving along. The exhibit will take place at the Clarion O'Hare on Saturday and Sunday, May 24 and 25. All are encouraged to participate by exhibiting animals.

Library: Jenny Picciola has drafted guidelines for borrowing books from the CHS library. These will be published in an upcoming issue of the *Bulletin*, and distributed with each book borrowed from the library. Also, new books have been added to the library from the CHS inventory.

Shows: There will be no Volo Bog show this Earth Day.

Old Business

Web Site: Jenny Picciola expects to have the appropriate software by April 1, at which time she plans to set up the new CHS web site. Jill Horwich will check with the Chicago Academy of Sciences to investigate the possibility of the CHS "piggybacking" on their site.

Book inventory: All the books have been inventoried and packed, and are now ready to transport upon sale. Special thanks to Jenny Vollman, Lori King-Nava, Gary Fogel, Iggy Ihrig, Steve Spitzer and Mike Dloogatch for this herculean effort on behalf of the CHS. A discussion was held regarding various options for disposition of the books and the possibilities of reinstating the CHS book service in some limited form.

Raffle: Jenny Picciola plans to solicit new donations of CHS raffle items. She will organize the items and store them at the Field Museum with the library cart.

Logo: A discussion was held regarding appropriate and inappropriate use of the CHS logo and letterhead for items such as business cards or communications not approved by the CHS Board of Directors. In general, before having business cards printed, or sending out any communications on CHS letterhead, members should obtain board approval for such actions.

New Business

Trailer storage: The CHS is looking for a new location to park its trailer, which contains items such as the turtle pen and the display cages used at ReptileFest and other shows.

Activities: Jack Schoenfelder suggested that the CHS plan more fun events for its local membership, especially in light of the cancellation of this year's Salamander Safari. A volunteer is needed to look into organization of a CHS picnic this summer. Anyone having other ideas for fun or interesting activities should call Steve Spitzer. John Driscoll suggested we also look into ideas for generating more interest and participation among our nonlocal membership.

Round Table

Gary Kostka: Anyone needing CHS letterhead and envelopes should contact Gary Kostka.

Gary Fogel: We are inviting "Ben Loves Chicago" to ReptileFest.

Lori King Nava: Thanks to Audrey Vanderlinden for plugging ReptileFest at her recent Boy Scout presentation.

Mike Dloogatch: Mike has had a walk-through of Lincoln Park Zoo's (as yet empty) new small mammal and reptile house. The Zoo needs volunteers to staff that exhibit's Education Center. CHS members are encouraged to volunteer.

Jill Horwich: The Chicago Academy of Sciences will be opening its new museum in Lincoln Park in 1998. At that time, the Academy will need a large staff of docents and volunteers. CHS members are encouraged to volunteer their time for the Academy. In the meantime, the Academy's Nature Museum is temporarily located at North Pier. CHS members are all encouraged to exhibit at the annual Academy of Sciences Reptile Weekend this fall.

All Present: The CHS extends its condolences to Audrey Vanderlinden on the death of her father.

The meeting adjourned at 10:55 P.M.

Respectively submitted on behalf of Audrey Vanderlinden

Jill Horwich

Advertisements

American Federation of Herpetoculturists: A nonprofit national membership organization of herpetoculturists, veterinarians, academicians and zoo personnel involved in the captive husbandry and propagation of amphibians and reptiles. Membership includes highly acclaimed magazine, *The Vivarium*, dedicated to dissemination of information on herpetocultural accomplishments, herp medicine, breeding and maintenance, field studies and adventures, enclosure design and much more. AFH membership is \$26. Send information requests to: AFH-News, P.O. Box 300067, Escondido CA 92030-0067.

For sale: rats and mice—pinkies, fuzzies and adults. Quantity discounts. Please send a SASE for pricelist or call Bill Brant, *THE GOURMET RODENT*, 6115 SW 137th Avenue, Archer FL 32618, (352) 495-9024, E-mail <GrmtRodent@aol.com>.

For sale: murine-pathogen-free rats and mice available in all sizes, live or frozen: pinkies, fuzzies, crawlers, small, medium and large. Frozen crawler mice in lots of 2000, \$.17 each. Also available, full grown hairless mice. FOB shipping point. Master Card accepted. Call (518) 537-2000 between 8:00 A.M. and 5:00 P.M. or write SAS Corporation, 273 Hover Avenue, Germantown NY 12526 for prices and additional information.

For sale: high quality feeder mice. Shipped UPS Next Day Air. All mice are properly processed to insure a quality product. Fourth year of production and supply of frozen feeder mice. Prices: pinkies, \$25/100; fuzzies, \$30/100; weanlings, \$35/100. Also available are 4 oz. + rats, \$100/100. Quantity discounts available. The Mouse Factory, P.O. Box 85, Alpine TX 79831, (915) 837-7100, Ray Queen.

For sale: from Bayou Rodents, excellent quality feeder mice and rats. Every size available. Pinks starting at \$20/100. Orders are shipped by overnight service Monday thru Thursday. We accept Visa, MasterCard and Discover. For more info, contact Rhonda or Peggy, (800) 722-6102.

For sale: **high quality frozen feeders.** Over a decade of production and supply. Seven sizes of mice available: small newborn pinkies up to jumbo adults. Prices start at \$25 per 100. Feeders are separate in the resealable bag, not frozen together. Low shipping rates. Free price list. Kelly Haller, 4236 SE 25th Street, Topeka KS 66605, (913) 234-3358 evenings and weekends.

For sale: In stock, Flex-watt and Ultra-therm heating products. **Frozen rodents** always available. Mice: pinkies–crawlers, 3/\$1; weanlings, 40¢; subadult, 50¢; adults, 65¢; large adults, 75¢. Rats: small, 85¢–\$1; medium, \$1.25–2.00; large, \$2.25–2.75; jumbo, 3/\$10. Call on quantity discounts [note: discount on orders picked up at CHS meetings]. Live rodents available at higher prices. **Available now:** newsletter/catalog—many unique/hard-to-find herp husbandry items. Send business-size SASE for catalog, or call. Scott J. Michaels, D.V.M, Serpent City, P.O. Box 657, Island Lake IL 60042, (815) 363-0290.

For sale: **Melamine cage by Custom Cages, Inc.**, 6' × 28" × 32", excellent condition, 2 porcelain incandescent sockets, 48" fixture, Kane heat mat, locking clasp, separate feeding door, and matching stand that can be used for additional storage or even a second enclosure, only \$400 or trade for 2 smaller wooden enclosures (or 4' Neodesha); **custom built glass cage**, 5' × 2' × 2', only \$75, must pick up. Rob Carmichael, (847) 615-4388, leave message on voice mail, or E-mail at <RCarmic416@aol.com>.

For Sale: **Reptile D-lights.** Our 8% is the first and only fluorescent light bulb that duplicates the UV-B output of the sun while having an excellent color rendition (CRI 91). Let your reptile make *exactly* the right amount of vitamin D. Stop under- or overdosing with all those powders. A must-have for iguanas, uromastyx, bearded dragons and all diurnal basking lizards. Get yours now! Available in 18", 24", 36", 48". \$34.95 each plus shipping. In California please add 7.75% sales tax. Dealer inquiries invited. Scott Solar (909) 627-3274; 9 – 9 Pacific Time or; Reptek@aol.com anytime. For Animal Use Only.

For sale: handcrafted miniature cartoon-like sculptures of any herp. Refrigerator magnets, desk ornaments, paperweights, earrings, pins etc. You name it—I'll make it. Prices vary. Dave Golde, (847) 679-1530.

For sale: 40" reptile handler's tongs (Midwest Products), \$35; never-used 45" snake hook, \$6; brand-new snake-proof leggings, \$15 to you. John, (773) 772-8772.

For sale: herp books. *The Reptile World* by Clifford Pope, no DJ, \$32; *Wildlife of the South Seas* by Roedelberger and Groschoff, 1967, 216 pp., many b&w and color photos—frilled lizard, Komodo dragon and marine iguana are only a few of the reptiles pictured and discussed—DJ, \$32; *Graeme Gow's Complete Guide to Australian Snakes* by Gow, 1993 (1989), 171 pp., color photos of nearly all known species and subspecies, as new, \$45; *Wild Life in Australia Illustrated* by Charles Barrett, no date (probably late 40s), 240 pp., many b&w photos and color paintings, 40 pages on reptiles including bearded dragons, geckos, skinks, monitors, pythons, \$32. All hardbound in very good to excellent condition. Prices postpaid. William R. Turner, 7395 S. Downing Circle W., Littleton CO 80122, (303) 795-5128.

For sale: April 1997 release. *Captive Husbandry and Propagation of the Boa Constrictors and Related Boas* by David Fogel (Krieger Publishing). The most comprehensive volume on the subject. All major captive care considerations are addressed allowing the keeper of any boa species to provide for, and possibly breed their captives. Comprehensive chapters on heating devices and their application to herpetoculture, and designing a herp room will be extremely beneficial for everyone maintaining any species of reptiles or amphibians in captivity, as well as the boa keeper. Hard cover with dust jacket, 60 color and 14 b&w photographs, over 100 pages. Signed or personally inscribed (provide instructions with order) copies are available from the author for \$33.50 each plus shipping (\$2.50 for the first copy and \$1 each additional copy). Send money order or check to: David Fogel, The Herp House, 1750 Haines Road, Orwell OH 44076, (216) 685-4615 phone, (216) 685-4572 fax.

For sale: *TURTLES*, the critically acclaimed book by Anita Baskin-Salzberg and Allen Salzberg. Only \$20, postage and shipping included. This is the book "Herp Review" as well as "Chelonian Conservation and Biology" called one of the most accurate and beautiful on turtles for children to come along for a long time. If not for you, or your child, consider donating *Turtles* to your local school or children's library. It's tax deductible. Just send your check to A. Salzberg, 67-87 Booth Street -5B, Forest Hills, NY 11375. We'll autograph it upon request.

For sale: a boa you don't have to feed—because it's wrapped around Alice Cooper's head! Black & white photo plus autographed "Killer" CD matted and ready for framing, \$225. Herps, drugs and rock & roll all in one place. Henry Cohen, 24 St. Johns Place, Buffalo NY 14201, (716) 881-6724.

For sale: **Reptile cage plans.** Finally, an easy and inexpensive way to build your own cages. Choose from four different plan sizes. Small (24 × 24 × 24), Medium (48 × 24 × 24), Large (48 × 24 × 36), or Extra-large (72 × 24 × 36). Based on width × depth × height (in inches). Each set of plans comes with complete instructions, parts list, detailed assembly instructions, and a figure of a completed cage. Plans are \$8 each, or all four plans for \$24. Also available, electric line thermostats. Easy to use and install. Takes minutes and installs directly into the electric line that feeds your heat lamp. Only \$30. Please mail orders to Tait Kjellberg, P.O. Box 72087, Davis CA 95617.

For sale: two Indian roofed turtles, \$40 each. Jim, (708) 425-1152.

For sale: hatchling leopard tortoise, \$100 or best offer. Also boa constrictor babies, born 4/1/97. Tonya Maris, (630) 851-2331.

For sale: 10-month-old Nile monitor (mint condition), \$50; beautiful subadult male red/yellow bearded dragon, \$100. Also, 75-gallon tank with iron stand and tank heater, \$100. Iggy, (773) 342-2028.

For sale: c.b. 1996 chuckwallas, beautiful babies, flawless, \$75 each. Richard, (864) 656-3625 (W) or (864) 654-1573 (H). [SC]

Advertisements (cont'd)

For sale: northern blue-tongued skink, \$125. Brian, (773) 581-3572.

For sale: Beautiful, captive-born animals. Bearded dragons—reds, \$75–125, true yellows, \$125, reds/sandfires, \$125, **vitikins**, \$75; adult male bearded dragons—reds, \$200, normals, \$125; bluetongue skink babies, \$150; frilled lizard babies, \$400; *sulcata* tortoise babies, \$100; one male and two female *sulcata* tortoises, adult breeding trio, one female is gravid, \$2000/group. Minimum for shipping, \$100. No minimum for pick-up. Ask about quantity discounts. **Midwest Reptile Farm**, Elk Grove Village IL, (847) 593-2831.

For sale: captive-bred snakes, lizards, tortoises, and amphibians. Prospective births and hatchlings include: leopard geckos, Jackson's chameleons, carpet chameleons, African spurred tortoises, rat snakes, king snakes, milksnakes, black and northern pine snakes, western hognose snakes (permit needed in Illinois), African house snakes, spotted pythons, Macklot's pythons, Colombian boas, Brazilian rainbow boas. Also feeder mice available in quantities with rats coming soon. Send SASE for current price list or call/fax (903)693-3379 or E-mail <bobball@panola.cc.tx.us> R. L. Ball, 226 N. St. Mary Street, Carthage, TX 75633.

For sale: **CANDOIA!** Fifteen male and 20 female New Guinea tree boas (*carinata*), c.b. babies and adults available, nice patterns and colors, \$50–100 each; 10 male and 10 female Solomon Islands ground boas (*paulsoni*), c.b. 2/97, nice colors, \$25–50 each; 5 male and 5 female Isabel Island boas (the white ones), \$50–100 each. Now taking deposits for Solomon Islands tree boas (*bibroni*) due this summer. Also available: one male and one female Queensland carpet pythons, c.b. Sept. '96, black & gold beauties, \$400/pair; one male and one female Savu pythons, c.b. '96, bright orange, \$1000/pair. Call or write for free list. Jerry Conway, 7154 N. University Drive, #102, Tamarac FL 33321, (954) 722-8758.

For sale: Dumeril's boas, adult pair, \$800. Also, well started juvenile jungle carpet pythons, from beautiful black & yellow adults. Expected soon - Borneo blood pythons, Argentine boas, northern blue-tongue skinks. All c.b. Bill Montgomery, (512) 285-5520, E-mail <Tiliqua@aol.com>. [TX]

For sale: pair of Brazilian rainbow boas (*Epicrates c. cenchria*), c.b. '94 orange 6' male and '95 orange/brown 5' female, both in excellent health and ready to breed this year, \$650 or best offer. Will not ship, located in near Chicago. Robert Sacha, (708) 636-3286, E-mail <eros63@aol.com>.

For sale: **Chondros, Chondros, Chondros!** Ophiological Services is ready to provide you with your own captive-born green tree python from the world's largest and most diversified genetic collection of green tree pythons, second to none. All animals are very well established with data cards, genealogy charts, and scientific reprints. Available for sale are babies, juveniles and 1–2 year olds. Other pythons, boas and colubrids available. Eugene Bessette, (352) 495-3075 phone, (352) 495-2952 fax, (Archer FL). We accept Visa and MasterCard.

For sale: **Mandarin rat snakes**—captive born F₁ and F₂ generations, August/September '97, unrelated bloodlines, care sheet. Guaranteed healthy, feeding, sexed. Now accepting reservations, \$700 each, \$1300/pair or \$1200/pair if paid in full in advance. Great Valley Serpenterium, Bill Gillingham, 2379 Maggio Circle C, Lodi CA 95240, (209) 369-7737 phone, (209) 369-3907 fax, E-mail <wbgill@inreach.com>.

For sale: two adult female Mexican black kingsnakes (*Lampropeltis getula nigrata*), all black, and two 2' Neodesha cages with tempered glass fronts. Snake plus Neodesha cage, \$100. Ken Skiles, (773) 525-6286.

For sale: Hope to be incubating eggs of the following very soon: Northern pine snakes (*Pituophis m. melanoleucus*)—three types—North Jersey stock, from as far north as *Pituophis* occurs in the east, \$120/pair; South Jersey stock, the classic “Barrens” pine, \$100/pair; Virginia/Alabama, a black and white animal whose parents originated from the abovementioned states, \$80/pair (I kept a female back from last year; she is a looker). Bull snakes (*P. m. sayi*), yellow-headed, a dark brown snake with an unpatterned yellow head, \$40/pair; “hats,” the pallid, handsome animals from Canada, \$50/pair. Delaware corn snakes (*Elaphe g. guttata*), they're pretty, and get big, some over 5' (a corn with an “*obsoleta*” body), \$35/pair. Future projects include red bulls, black bulls (two locales) and black pines (three locales). These prices are lower than in previous ads and apply only to CHS members. Will consider quantity discounts. Bart Bruno, (203) 773-9257, evenings and weekends.

For sale: beautiful, feeding snakes. Wholesale quantities to dealers, individual purchases welcome. Send SASE for **free** price list. Robert Applegate, P.O. Box 338, Campo CA 91906, (619) 478-5123. Also, free phone consultation on snake husbandry problems as a service to the herp community.

For sale: **Northern Mexican pine snakes**, *Pituophis deppei jani*, as seen in the January 1997 *Reptiles* magazine, captive-born babies from a large, unrelated, locality-matched breeding group. The majority of *P. d. jani* in captivity originate from my stock. Care sheet included in every order. Alan Kardon, (210) 623-4311 after 6:00 P.M. Central Time.

For sale: expected '97 offspring. New Jersey coastal plains milksnake, sharp rust/orange, \$50–250; anerythristic Hondurans, \$1000, possible hets, \$250; albino Florida garters, creamy yellow/white, nice, \$300, hets, \$150; albino plains garters (two bloodlines); albino Cal kings, lavender/white & gorgeous yellow with purple splotches, \$300, hets, \$150. Scott, (919) 934-0110. [NC]

For sale: Send SASE to CRC, P.O. Box 0731, Las Vegas NV 89125-0731 for brochures and list of species available. Limited bookings available for guided tours of herpetological collection sites in Nevada. Call/fax (702) 471-0240. E-mail <fpglwmau@anv.net>.

Free: Large iguana looking for good home, almost 5' and very healthy. Does not bite and doesn't mind being handled. Three years old and set in his ways concerning feeding. Will give to the right person along with large enclosure. He likes to run the house and sit in a sunny window once in a while. I have too many pets. Prefer someone with lizard experience to take care of him. (219) 924-7646. [IN]

Free to good home: female Burmese python. Tonya Maris, (630) 851-2331

Herptile shows: **Repto-rama**—live educational presentations of local herps and herps of the eastern U.S. for parties, scout groups, nature centers etc. **Salamanderiffic**—live educational presentations and exhibits of the tailed amphibians of the U.S. for nature centers, scout groups, community centers, etc. For all age groups. Dave Golde, (847) 679-1530.

Pet-sitting service: Complete in-home pet and plant care, specializing in reptiles and other unique pets. Dogs and cats welcome with open arms, midday dog walking. Experienced and dependable service by devoted animal lovers, serving Chicago and suburbs, reasonable prices, fully insured and bonded. Ask about our habitat consultation and custom-made cages. Exotics & More, (312) 728-5457 or page us at (708) 750-3688.

Software: **TRACS™** record keeping and breeding software for IBM and compatibles. TRACS™ Professional, a full system, \$129; TRACS™ Lite, for the hobbyist, just \$39.95. Add \$5 s&h, \$10 outside U.S. Send for a working demo for \$10 (cost may be applied toward purchase). Or download demo free via Internet at <<http://www.herp.com/tracs/>>. Send check or money order to Leapin' Lizards, 23852 Pacific Coast Highway, #375, Malibu CA 90265.

Tours: Adventure tours to Madagascar! Join **Bill Love** seeing and photographing fauna and flora, heavily herp-biased, across the world's least known mini-continent. Much more fun than shoveling snow November–February. Contact him at: BLUE CHAMELEON VENTURES, P.O. Box 643, Alva FL 33920. TEL: (941) 728-2390, FAX: (941) 728-3276, E-MAIL: <blove@cyberstreet.com>.

Tours: **Road-riding in Costa Rica!** Treat yourself to the trip of a lifetime! Learn about tropical herps, find them, photograph them, see where they live. **Greentracks, Inc.**, offers the best herpetological tours led by internationally acclaimed herpetologists and herpetoculturists. See the Amazon, visit cloud forests, experience the world's greatest rainforest, super sunsets and good company. Call (800) 9-MONKEY.

Advertisements (cont'd)

Wanted: **U.S. salamanders.** I need mole (*Ambystoma talpoideum*), flatwoods (*A. cingulatum*), smallmouth (*A. texanum*), ringed (*A. annulatum*), barred tiger (*A. tigrinum mavortium*), long-toed (*A. macrodactylum*), Tremblay's (*A. "tremblayi"*), silvery (*A. "platineum"*; I have permits), Mabee's (*A. mabeei*), northwestern (*A. gracile*), California giant (*Dicamptodon ensatus*), slender (*Batrachoseps* sp.), clouded (*Aneides ferreus*) and black (*A. flavipunctatus*); and ensatinas and other species. They are to be used for educational exhibits and programs. Cash, trade or donation. Dave Golde, (847) 679-1530.

Wanted: tiger salamanders (*Ambystoma tigrinum* ssp.). Seeking all subspecies from the U.S., Canada and Mexico, as well as specimens from introduced populations. Locality data important. Bart Bruno, (203) 773-9257, evenings and weekends.

Wanted: aberrant, unusual garter snakes. Scott, (919) 934-0110. [NC]

Wanted: big-headed turtles; mata mata turtles; Mexican giant mud turtles (*Staurotypus triporcatus*); exceptionally large common snappers (45 lbs. & up); large alligator snappers (over 90 lbs.); spectacled caiman from Trinidad, Tobago and Surinam; dwarf caiman; smooth-fronted caiman; albino turtles (except red-eared sliders). Walt Loose, (610) 926-6028, 9:00 A.M. – 1:00 P.M. or after 11:30 P.M. Eastern Time.

Wanted: Styrofoam boxes, any size or shape so long as they're not flimsy, preferably with cardboard liners, willing to pay from \$2 to \$5. Bring to CHS meetings. Scott J. Michaels, D.V.M, Serpent City, (815) 363-0290.

Line ads in this publication are run free for CHS members — \$2 per line for nonmembers. Any ad may be refused at the discretion of the Editor. Submit ads to: Michael Dloogatch, 6048 N. Lawndale Avenue, Chicago IL 60659, (773) 588-0728 evening telephone, (312) 782-2868 fax, E-mail <MADadder0@aol.com> .

News and Announcements

REPTILEFEST 1997

The yellow ReptileFest flyers that came with last month's *Bulletins* should have read "Sat & Sun, May 24,25." Instead the dates were given as May 25,26. A flyer with the correct dates is included with this issue.

Those in attendance at the past two CHS general meetings got to hear Jill Horwich creatively urge members to exhibit at ReptileFest. For those who missed it, two of her efforts are reproduced below:

- Top 10 Reasons You Should Participate in the 1997 ReptileFest**

 10. It's an excellent opportunity to show off your animals while educating the public.
 9. It's a chance to give something back to the Society that's done so much for you.
 8. You can observe and covet the interesting animals being exhibited by your fellow herpers.
 7. Exhibitors get in free.
 6. You can catch any number of flu and cold viruses from children visiting the show.
 5. Where else will you have the oportunity to answer the questions "Is it poisonous?" and "Does it bite?" over and over again?
 4. Cheap hotel rooms.
 3. Excellent raffle prizes will be awarded to the lucky exhibitors who draw the winning numbers.
 2. No matter how hard you work, your exhibit will be completely overshadowed by someone else's.
 1. Free food.

'Twas the night before ReptileFest
And on the north side of town
Lori King-Nava was sleepless
And pacing around.

She'd planned the event with the utmost of care;
What if Saturday came and no one was there?

We'd distributed flyers in all the pet stores,
Run newspaper ads and sent faxes by scores.

The tables were set up;
The vendors were ready;
The turtle pen was built
And the lighting was steady.

And all around town children slept in their beds
While visions of reptiles danced in their heads.
This was the weekend they awaited all year;
They'd see boas, iguanas;
That's reason to cheer.

There'd be turtles, chameleons and maybe a frog,
But without our exhibitors, the show is a dog.

Back at the Nava house, Lori was distraught.
"If no one exhibits, all our work is for naught. "
And I heard Rick exclaim as he held her hand tight,
"Will you please settle down? For the last time, Goodnight!"

So bring all your creatures
The great and the small,
Because without you,
There'll be no show at all.

UPCOMING MEETINGS

The next meeting of the Chicago Herpetological Society will be held at 7:30 P.M., Wednesday, April 23, at the Field Museum of Natural History, Roosevelt Road at Lake Shore Drive, in Chicago. **This is one week before the usual “last Wednesday of the month” because of Members’ Night at the Field Museum.** This month’s speaker is **Ty Park**, owner of Midwest Reptile Farm in Elk Grove Village, who will talk on “Care and Breeding of Insectivorous Lizards.”

At the May 28 meeting we will depart somewhat from our usual format. After the business portion, we will break up into workshop groups to discuss specialized areas of herpetoculture. There will be groups on snakes, turtles, lizards, amphibians etc., led by CHS members with first-hand practical knowledge in these areas.

We are required to use the entrance on the west side of the museum. We have permission to use the staff parking lot to the west of the museum. Entrance to this lot is from McFetridge Drive, the wide street just to the south, between the museum and Soldier Field. **Due to the recent rerouting of Lake Shore Drive, there have been some changes in traffic flow — follow the signs to the “Museum Campus.”** From southbound Lake Shore Drive this means a right turn onto Roosevelt Road followed by a left on Columbus Drive. The #146 CTA bus goes directly to the museum. Unfortunately, it does not operate past 9:00 P.M. However, after the program anyone needing a ride to a CTA stop will have no trouble finding one—just ask any board member.

Turtle Club

The Chicago Turtle Club will meet Sunday, April 27, 1:00–3:30 P.M., at the North Park Village Nature Center, 5801 N. Pulaski, in Chicago. This will be a “show and tell” meeting at which members will show off their favorite animals.

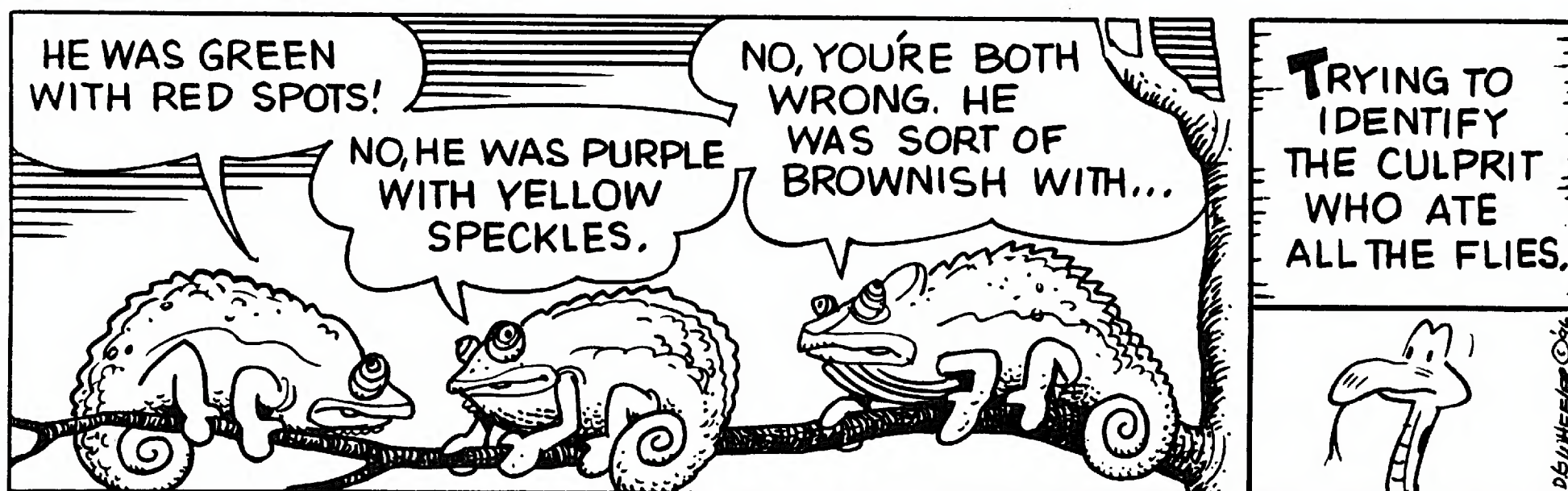
Amphibian Club

The Amphibian Club will hold its first field trip of the year to the Indiana Dunes, Saturday, April 19, to observe salamanders and frogs, and their egg masses. Field trips will be scheduled for the third Saturday of every month until September. The next field trip will be to Moraine Hills State Park, Saturday, May 17, to observe anuran breeding. The next meeting of the Amphibian Club will take place at the Grove National Historic Landmark Interpretive Center, 1421 Milwaukee Avenue, in Glenview, on Saturday, April 26, 6 – 9 P.M., at which time, after a brief discussion of the upcoming field trip, American toads will be observed in and around their breeding ponds on the Grove’s property. Call Dave Golde at (847) 679-1530 for additional information.

10TH ANNUAL NEW YORK TURTLE & TORTOISE SOCIETY SEMINAR

On Saturday, May 10, 1997, the NYTTS will host an all-day (9 A.M. — 5 P.M.) seminar on turtle conservation/biology. The event will be held at the HDMC Environmental Center in Lyndhurst, New Jersey, just 20 minutes from Manhattan via the Lincoln Tunnel. The four speakers and their topics are: Dr. Peter Pritchard, African tortoises; Dr. Roger Wood, “Mass Mortality of Turtles in Sideneck Fossils and Contemporary Turtles”; Dr. Susan Lieberman, “Demystifying the Convention on Trade of Endangered Species (CITES)”; Dr. Steven Garber, “So-Called Harmless Human Activities and Their Effects on Turtle Populations.” Registration is \$30 before May 1; \$35 at the door. The fee includes lunch and a continental breakfast. Send check or money order to: NYTTS, P.O. Box 878, Orange, NJ 07051. If you have any questions call (212) 459-4803. For travel information call the HMDC Environmental Center at (201) 460-8300.

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